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SUMMARY AND CONCLUSION

This study was carried out during three successive seasons of 2013/2014, 2014/215 and 2015/2016 on parent and first two ratoon crops of three banana cultivars namely 'Williams Zeaf', 'Grand Naine' and 'Hindi' grown in New Orchard situated at Bardees region, El- Baliana city, Sohag Governorate, Egypt. The considered banana plants were raised by tissue culture, planting in a sandy clay loam, spacing at 3.5x3.5m between and within, respectively. Three ratoons were selected and left per each stool on the first week of July each year from plants emerging in May (2014 and 2015) with plant density 1026 plant per feddan. Selected mother Banana (5 plants) of each cultivar had one plant per replication, first ratoons (15 plants) and second ratoons (15 plants) of each cultivar had five plants per replication were alike in growth, and the tested cultivars laid out as a randomized complete block design (RCBD) with five replicates. Therefore, this study aimed to evaluate of vegetative growth behavior and productivity of three banana cultivars to identify the most promising ones which could be recommended for Sohag conditions in order to local banana production and gain a foothold in international banana markets.

5.1. Vegetative growth parameters:

5.1.1. Leaf characters:

(1) In regard to the number of emerged leaves per plant data revealed that, second and first ratoon were the best cycles for Williams Zeaf, Grand Naine and Hindi cultivars followed by mother plant and that Hindi and Williams Zeaf cultivars, respectively are superior compared to Grand Naine.

(2) In regard to the number of functional leaves at flowering data preformed that, second and first ratoon were the best cycles for Williams Zeaf, Grand Naine and Hindi cultivars followed by mother plant and that Williams Zeaf and Grand Naine cultivars, respectively are superior compared to Hindi.

(3) In regard to the leaf area and assimilation area data revealed that, second and first ratoon were the best cycles for Williams Zeaf, Grand Naine and Hindi cultivars followed by mother plant and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

2.1.2. Pseudostem characters:

(4) Concerning the pseudostem height, girth, height per girth ratio and cross-sectional area data preformed that, second and first ratoon were the best cycles for Williams Zeaf, Grand Naine and Hindi cultivars followed by mother plant and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

2.2. Crop duration (days):

(5) In regard to the period to bunch shooting data preformed that, mother plant was the best cycle for Williams Zeaf, Grand Naine and Hindi cultivars followed by the second and the first ratoon and that Williams Zeaf cultivar followed by Grand Naine are superior compared to Hindi.

(6) In regard to the period to bunch harvesting data revealed that, second and first ratoon were the best cycles for Williams Zeaf, Grand

Naine and Hindi cultivars followed by mother plant and that Williams Zeaf cultivar followed by Grand Naine are superior compared to Hindi.

(7) In regard to the plant life cycle data preformed that, mother plant was the best cycle for Williams Zeaf, Grand Naine and Hindi cultivars followed by the second and first ratoon and that Williams Zeaf cultivar followed by Grand Naine are superior compared to Hindi.

(8) In regard to the number of suckers per plant data revealed that, all the three cycles were the best for Williams Zeaf, Grand Naine and Hindi cultivars and that Williams Zeaf cultivar followed by Grand Naine are superior compared to Hindi.

2.3. Yield and its characters:

2.3.1. Yield and Bunch characters:

(9) In regard to the yield and bunch weight data preformed that, second and first ratoon crop were the best cycles for Williams Zeaf, Grand Naine and Hindi cultivars followed by Main crop and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(10) In regard to the number of hands and finger per bunch data preformed that, second and first ratoon crop were the best cycles for Williams Zeaf, Grand Naine and Hindi cultivars followed by main crop and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

2.3.2. Hand characters:

(11) In regard to the hand weight data preformed that, second and first ratoon crop were the best cycles for Williams Zeaf, Grand Naine and Hindi cultivars followed by main crop and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(12) In regard to the number of finger per hand data revealed that, second ratoon crop was the best cycle for Williams Zeaf, Grand Naine and Hindi cultivars followed by first ratoon crop and main crop came the least and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

2.4. Fruit quality:

2.4.1. Fruit physical characters:

(13) In regard to the finger weight data preformed that, second ratoon crop was the best cycle for Williams Zeaf, Grand Naine and Hindi cultivars followed by first ratoon crop and main crop came the least and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(14) Concerning the finger length data preformed that, second and first ratoon crop were the best cycles for Williams Zeaf, while the second ratoon crop was the best cycles for Grand Naine and Hindi cultivars followed by first ratoon crop and main crop came the least and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(15) As for the finger diameter data revealed that, second and first ratoon crop were the best cycles for Williams Zeaf, Grand Naine and

Hindi cultivars followed by main crop and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(16) As related to the finger shape data revealed that, second and first ratoon crop were the best cycles for Williams Zeaf, while the second ratoon crop was the best cycles for Grand Naine and Hindi cultivars followed by first ratoon crop and main crop came the least and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(17) Concerning the pulp weight data preformed that, second ratoon crop was the best cycle for Williams Zeaf and Grand Naine cultivars followed by first ratoon crop, while the second and first ratoon crop were the best cycle for Hindi cultivars and main crop came the least and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(18) As for the pulp percentage data revealed that, second and first ratoon crop were the best cycle for Williams Zeaf, Grand Naine and Hindi cultivars and main crop came the least and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(19) Concerning the peel weight data preformed that, main crop was the best cycle for Williams Zeaf, Grand Naine and Hindi cultivars followed by the first and second ratoon crop and that Hindi cultivar is superior compared to Grand Naine and Williams Zeaf.

(20) As for the peel percentage data revealed that, second and first ratoon crop were the best cycle for Williams Zeaf and Grand Naine than

in main crop and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(21) As related to the pulp per peel ratio data revealed that, second and first ratoon crop were the best cycle for Williams Zeaf, Grand Naine and Hindi cultivars and main crop came the least and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

2.4.2. Fruit chemical content:

(22) Concerning the total soluble solids (TSS) percentage data preformed that, second and first ratoon crop were the best cycles for Williams Zeaf, Grand Naine and Hindi cultivars followed by mother crop and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(23) As for the acidity percentage data revealed that, second ratoon crop was the best cycle for Williams Zeaf, Grand Naine and Hindi cultivars followed by first ratoon crop and mother crop with no significant differences between them.

(24) As related to the total soluble solids (TSS) per acid ratio data revealed that, second and first ratoon crop were the best cycles for Williams Zeaf, Grand Naine and Hindi cultivars followed by mother crop and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(25) In regard to the total and non-reducing sugars percentage data revealed that, second and first ratoon crop were the best cycles for Williams Zeaf, Grand Naine and Hindi cultivars followed by mother crop

and that Williams Zeaf followed by Grand Naine cultivars are superior compared to Hindi.

(26) Concerning the reducing sugars percentage data preformed that, Second and first ratoon crop were the best cycles for Williams Zeaf and Grand Naine cultivars followed by mother crop and that Williams Zeaf and Grand Naine cultivars are superior compared to Hindi.

2. 5. General evaluation of tested cultivars:

(26) General evaluation of tested cultivars showed that both Williams Zeaf and Grand Naine plants gained the highest scores, hence, must be planted these banana cultivars to obtain the high yield with good fruit quality under this area condition. Furthermore, the best one was Williams Zeaf Plants since the highly production.

From these results it can be concluded and recommended that:

(1) Concerning the leaf area (cm^2) and assimilation area (m^2), pseudostem height and girth (cm), pseudostem cross-sectional area (PCA cm^2), period to bunch shooting (days), period to bunch harvesting (days), plant life cycle (days), number of suckers per plant, yield (ton/fadan), bunch weight (Kg), number of hands and finger/bunch, hand weight (Kg) and number of finger/hand, finger weight (g), finger length and diameter (cm), pulp weight (g), pulp (%), peel (%), pulp/peel ratio, total soluble solids (TSS) %, TSS/acid ratio, total and non-reducing sugars (%) Williams Zeaf cultivar followed by Grand Naine are superior compared to Hindi.

(2) As for number of functional leaves at flowering, finger shape (L/D) index, and reducing sugars (%) Williams Zeaf and Grand Naine cultivars are superior compared to Hindi.

(3) In regard to number of emerged leaves per plant, Hindi and Williams Zeaf cultivars, respectively are superior compared to Grand Naine.

(4) As related to pseudostem height/girth ratio and peel weight (g) Hindi cultivar is superior compared to Grand Naine and Williams Zeaf.

This study suggested that, both Williams Zeaf and Grand Naine must be planted to obtain the high yield with good fruit quality under south Egypt condition. Furthermore, the best one was Williams Zeaf plants since the highly production.