SUMMARY AND CONCLUSION

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The present investigation was undertaken during the two successive 2001 and 2002 seasons on eight plum cultivars namely, Hollywood, Methly, Climax, Golden Japanese, Santa Rosa, Beauty, El-Dorado and Durado plum trees grown in Experimental Station of El-Kanater belonging to Horticultural Research Institute, Kalyobia Governerate.

The investigated trees were about 11 year-old, budded on Mariana rootstock except both El-Dorado and Durado cultivars were budded on Nemaguard peach rootstock. The selected trees were healthy, nearly uniform as possible in vigour, planted at five meters apart in a clay loamy soil and received regularly the same horticultural practices adopted in the region.

This study was carried out to evaluate and throw some lights on the following aspects:

1. Phynological phase.
2. Vegetative growth measurements.
3. Leaf nutritional status.
4. Percentage of fruit set and tree fruiting.
5. Fruit characteristics.

The obtained data can be summarized as follows:

IV – I - Phynological phases:

With regard to the start of vegetative bud breaking of some plum cultivars under study, the obtained results showed that Hollywood cultivar was the earliest one, it started on March 3rd and 8th in both 1st & 2nd seasons, respectively. Meanwhile, both El-Dorado and Santa Rosa cultivars ranked the last (March, 14th and March, 18th) in both 2001 and 2002 seasons of study, respectively these of both El-Dorado and Golden Japanese were the most delayed cultivars. Moreover other cultivars came in between. Furthermore, the difference between the earliest and the latest one reached about 11 days in the 2001 season.

Concerning the floral bud breaking Hollywood plum cultivar was the earliest cultivar, it occurred on February 28th and March 3rd in first and second seasons, respectively. Meanwhile, other plum cultivars were in between. The difference between the earliest and latest cultivars reached about 12 and 14 days in the first and second seasons, respectively.

Regarding the date of full bloom, the obtained data showed that the full blooming stage took place early in Hollywood cultivar on March 21st and 25th in 1st & 2nd seasons, respectively. While full bloom of both Santa Rosa and Beauty

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Regarding the date of full bloom, the obtained data showed that the full blooming stage took place early in Hollywood cultivar on March 21st and 25th in 1st & 2nd seasons, respectively. While full bloom of both Santa Rosa and Beauty

cultivars was obviously delayed through approximately the 1st week of April during both seasons of study. Other plum cultivars under this study ranked in between taking into consideration that difference between the earliest cultivar and the latest one reached about 13 or 10 days during the 2001 and 2002 seasons, respectively.

As for the duration extended from start of floral bud breaking till full blooming stages, evaluated plum cultivars varied greatly in this respect. The tallest duration was closely related to Beauty cultivar (25-30 days) followed by both El-Dorado and Durado cultivars (25-26 days). The shortest period was observed with Golden Japanese (14-18 days), while other cultivars were in between.

As for the maturation date, it is quite clear that the evaluated 8 cultivars could be generally classified into the following groups:

1- The first group included Hollywood, Beauty, Methly and Clymax and to some extent Golden Japanese, which reached maturation stage through nearly the 1st third of June.

2- Second group is represented by El-Dorado, Durado and Santa Rosa which are the delayed ones and their maturation took place nearly at the last week of June.

Neverthless, duration extended from full blooming till harvesting, data obtained showed that the longest duration was in closed relationship to both El-Dorado and Durado cultivars, while the reverse was coupled with Beauty and Hollywood cultivars. Moreover, other cultivars were in between.

Regarding the date of fruit set, data obtained showed clearly that Hollywood cultivar was the earliest one in this concern (March 22nd and March 27th) during both the first and second seasons, respectively. Meanwhile, Santa Rosa and El-Dorado were the latest ones (April, 7th) in the 2001 season, while Santa Rosa cultivar was the latest one in the second season of study followed by El-Dorado (April 10th and 8th) respectively. The difference between both the earliest and latest cultivars reached about 16 days in the 2001 season and 14 days in the 2002 season of study.

V – II - Vegetative growth measurements:

In this regard the increase in both shoot length (cm) and trunk diameter (%); number of leaves/shoot and leaf characteristics (average dry weight; length; width; shape index; area and area factor) were the investigated growth measurements of the evaluated eight japanese plum cultivars. Data obtained during both 2001 & 2002 seasons revealed that the abovementioned vegetative growth measurements didn't follow

the same trend regarding their relationship to the evaluated plum cultivars. Whereas each parameter followed its own trend from one hand either such trend may be coincided or not with one/more of the other investigated measurements from the other side.

Anyhow, regarding the increase in shoot length and trunk diameter; average number of leaves per shoot and leaf dry weight, it was quite clear the superiority of the three plum cultivars (Beauty; Methly and Clymax) over other evaluated ones, especially with the three former parameters and to some extent with the later one (leaf dry weight). Contrary to that Hollywood was the inferior concerning the aforesaid 4 parameters, beside both El-Dorado and Durado cultivars as the increase in shoot length and number of leaves/shoot were concerned. However, the trend took the other way around with the increment % in trunk diameter and average leaf dry weight, whereas both Durado and El-Dorado were approximately similar to Methly, Beauty and Clymax. Moreover, other cultivars were in between. Such trend was true either data of each season or an average of two seasons were concerned.

Referring the measurements of leaf characteristics i.e. leaf dimensions (leaf length & width), leaf shape index, average area

and area factor, data obtained during both seasons displayed the following:

1- The variances in leaf shape index and area factor were too slight, whereas all evaluated eight cultivars exhibited approximately the same values i.e. about 1.5 and 0.70 for former and later parameters, respectively.

2- Variations between the evaluated plum cultivars regarding their leaf dimensions (length & width) and area were so pronounced. Hence, El-Dorado and Durado were statistically the superior followed by Santa Rosa, Hollywood and Golden Japanese cultivars as they ranked second. However, Methly; Clymax and Beauty cultivars wre the inferior especially former one (Methly) and to great extent second cultivar (Clymax).

V – III – Nutritonal status (leaf mineral composition):

With regard to leaf macroelements content, data obtained during both seasons revealed that two trends were detected. Hence, with leaf N, P and K contents evaluated plum cultivars varied obviously, whereas Santa rosa; El-Dorado and Durado cultivars wre the richer as well as both Golden Japanese and Beauty were to some extent relatively richer especially as N & K levels were concerned. On the other hand, the second trend was

dealing with both Ca and Mg%, whereas all evaluated eight plum cultivars were equally similar in their leaves contents.

Referring leaf micro-elements content of the evaluated plum cultivars, data obtained during both seasons revealed that each element followed its own trend. Whereas, leaf Fe content was greatly influenced by plum cultivar as both Golden Japanese and Hollywood were statistically the richest besides both Durado & El-Dorado cultivars wre also richer especially former one.

As for leaf Zn content, variations between various cultivars were less pronounced, in spite of Methly tended relatively to be richer while Santa Rosa was the poorest.

Neverthless, the differences in leaf Mn and Cu contents due to plum cultivars were completely absent from the statistical point of view, whereas all evaluated eight plum cultivars wre approximately the same.

V – IV - <u>Some measurements of cropping/productivity aspects:</u>

In this regard fruit set% and yield expressed either weight (Kg) or number of fruits produced er tree were the investigated fruiting measurements.

Data obtained during boht seasons revealed that both fruit set% and weight of harvested fruits per tree were in positive

relationship. Since the highest fruit set% in both El-Dorado and Durado, beside to Golden Japanese & Santa Rosa great extent were in closed positive relationship with their higher yield expressed as fruits weight per tree. The reverse was true with both Methly and Clymax cultivars, whereas their pronounced lower yield as weight of harvested fruits per tree was corresponded to their relative lower fruit set%. The unique exception in this regard was dealing with Hollywood cultivar whereas its lowest fruit set % was meeting by the relative higher yield (Kg/tree).

On the other hand, pertaining the relationship between boyt yield measurements (weight and number of harvested fruits per tree) the trend showed obviously that both parameters were conflicted (negatively correlated). Hence, the lowest yield expressed as weight of harvested fruits per tree was corresponging to the greatest number of fruits per tree in the three Methly; Beauty and Clymax plum cultivars.

However, the superiority of El-Dorado; Durado; Santa Rosa and Golden Japanese regarding their higher yield expressed as weight of harvested fruits per tree was correseponded to their inferiority pertaining ther number of harvested fruits per tree.

V – V – Fruit quality:

V - V - A - Fruit physical characteristics:

Average fruit weight; size; dimensions (height & diamter); shape index; flesh weight; seed weight and flesh/pit ratio besides flesh firmness were the fruit physical characteristics of the evaluated plum cultivars. Data obtained during both seasons revealed the supriority of El-Dorado regarding the fruit weight, size, dimensions and weight of both flesh and stone (pit) followed by Durado; Santa Rosa; Golden Japanese and Hollywood cultivars. Contrary to that Methly was the inferior, while both Beauty and Clymax cultivars were similar an showed relatively lower values approximately equal to those of Methly.

As for fruit shape index and flesh/stone ratio both parameters followed two opposite trends, whereas the evaluated japanese plum cultivars could be classified into two groups in this regard. The first group included Santa Rosa; Golden Japanese; Dorado and El-Dorado cultivars. Four members of such group had statistically more flattened fruits (having lower value of fruit shape index) from one hand, but characterized by their significantly higher flesh/stone ratio (about 25.0) from the other. Meanwhile second group included the four Hollywood; Beauty; Methly and Clymax plum cultivars, all characterized by their higher fruit shape index (less flattened or tended approximately

to be rounded in their shape). Besides, the flesh/stone ratio in fruits of the second group was severly reduced than the analogous one of the aforesaid group (approximately 16.0).

V - V - B - Fruit chemical properties:

Percentage of fruit juice total soluble solids and total titratable acidity (TSS & acidity) as well as TSS/acid ratio were the three investigated chemical properties for the eight evaluated japanese plum cultivars during both 2001 & 2002 seasons.

Regarding the fruit juice total soluble content (TSS%), data obtained during both 2001 & 2002 seasons revelaed that all 8 plum cultivars varied considerably. Hence, El-Dorado was statistically the superior (16.29%) followed by both Durado and Beauty which ranked second (14.35 & 14.60 %), while Hollywood came third (13.0 %). The reverse was true with both Methly and Clymax which were the inferior (11.72 & 11.24 %). Meanwhile, both Santa Rosa and Golden Japanese were in between (12.15 % for both). Such trend was true during both seasons, whereas the aforesaid values in this regard represented the average value for the corresponding cultivar during two seasons.

Neverthless, data obtained during both 2001 & 2002 seasons revealed that fruit juice total acidity % was greatly varied form one plum cultivar to another. Meanwhile, as an average of

two seasons was concerned it is quite clear that fruits of both Durado and El-Dorado cultivars had obviously the highest acidity % (0.835 & 0.860 %) followed by both Hollywood and Santa Rosa cultivars which ranked second (0.743 & 0.718 %). Contrary to that fruits of both Beauty and Golden Japanese cultivars had the least acidity (0.514 & 0.578 %). Moreover both Methly and Santa Rosa cultivars were intermediate in this concern (0.694 & 0.718 %).

Referring the fruit juice TSS/acid ratio of the evaluated eight plum cultivars, data obtained during both seasons revelaed that Beauty fruits were the superior (27.88) followed by Golden Japanes (20.73). On the other hand the lowest TSS/acid ratio was in closed relationship to fruits of the three Santa Rosa; Durado and Methly plum cultivars (16.63; 16.79 and 16.90). moreover, Hollywood; Clymax and to great extent El-Dorado cultivars were in between (18.59; 17.85 and 17.25).