

# Studies on the performance productivity and fruit characteristics of some loquat trees

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The present study was conducted at the Horticultural Experiment Station at Barrage, Kaliobia during two successive seasons 1983 and 1984, to study the performance, productivity and fruit characteristics of seven seedling loquat trees as well as three grafted loquat trees on quince rootstock of 27-year old. The obtained results could be summarized as follows :-

1- Tree growth All the studied loquat trees varied greatly in tree growth parameters.

a. Concerning shoot length, tree No. (2-2) gave the longest shoots, followed by those of grafted trees as well as tree No. (3-4). The shortest shoots were produced by tree No. (3-11). Moreover, trees No. (3-2), (2-1), (2-4) and (2-3) gave shoots medium in their lengths.

b. As for number of nodes per shoot, tree No. (3-4) surpassed all other trees, followed by tree No. (2-2) and grafted trees. The least number of nodes were noticed with shoots of trees No. (2-1) and (2-4). Other trees came in between in comparison with the highest and lowest limits.

c. Referring to leaf length, tree No. (2-1) and grafted trees gave the longest leaves. Moreover, leaf length of trees No. (3-2), (3-3), (2-2) and (4-4) were similar and took the average of the population. The shortest leaves were produced by tree No. (3-4) and (3-11).

d. Considering leaf width, the widest leaves were remarked on grafted trees, whereas the values of trees No. (3-2) and (3-11) were the least. Other trees were in between in this respect.

e. With respect to leaf index, trees No. (3-2) and (2-1) gave the highest values of leaf index, whereas trees No. (3-4) had the lowest value. No differences were noticed between the other trees in this respect.

f. As leaf area was concerned, the largest leaf surface area was produced by tree No. (2-1) and grafted trees. Meanwhile, the least leaf surface area was remarked on tree No. (3-11). Other trees lie within the population in this respect.

g. As for the relationship of leaf area and its length and width it was found that Leaf area (cm<sup>2</sup>) of seedling trees = 0.73 X leaf length (cm.) X leaf width (cm.). Leaf area (cm<sup>2</sup>) of grafted trees = 0.68 X leaf length (cm.) X Leaf width (cm.).

h. With respect to leaf petiole length, leaves of tree No. (2-2) have the longest petiole. On the contrary, trees No. (3-3) and (2-1) have the shortest leaf petiole. Moreover, values of leaf petiole length of other trees lie in between.

2- Tree flowering The flowering aspects of the different studied loquat trees varied greatly as follows :-

a. In regard to blooming period and blooming duration, grafted trees as well as both trees No. (2-1) and (3-4) bloomed earlier than all other studied trees (September, 20th. 1983 and October, 10th. 1984). Meanwhile, tree No. (2-2), (2-4), (3-2), (3-3) and (3-U) started to bloom later (October, 1st.) 1983 and October, 20th. 1984. On the other hand, all studied trees ended blooming period in 1983 season in November, 2nd. whereas, in the second season, grafted trees and trees No. (2-1) and (3-4) terminated their blooming (December, 5th.) earlier than other trees (ended blooming December, 15th.). Consequently blooming duration for grafted trees as well as trees No. (2-1) and (3-4) lasted 60 and 56 days in the first and second seasons respectively, whereas, it was 50 and 51 days in 1983 and 1984 seasons respectively for other trees.

b. Regarding number of flowers per branch, it varied greatly from season to another in most studied trees. However, branches of tree No. (2-2) had the highest number of flowers and had moderate comparison. Other trees were nearly similar number of flowers per branch.

3- Pollen grain morphology. General appearance The fresh pollen grains, in mass looked light yellow dust to the naked eye and appeared brownish under the microscope.

a. Polarity and symmetry Pollen grains were radiisymmetric, isopolar and aperturate. In equatorial view, they looked elliptical to oblong with single or two furrows.

c. General furrows and

germspores The pollen grains were tricolpate with spherical germ pores located at the center of each calpi.d. Pollen grain size Pollen grains were always of medium size, with the exception of trees No. (3-11), (3-2) and (3-3) as they had very few number of small pollense. Pollen grain shape Pollen grain shape was prolate for grafted trees and tree No. (3-3), and ranged between prolate and sub prolate for trees No. (3-4), (2-2) and (3-11).

86 -2 - Viability testa. 'Fresh pollen grains of different loquat trees showed 100% viability with acetocarmin staining test.

b. Pollen grain germination The lowest value of pollen grain germination was recorded by tree No. (3-4), while the highest value was noticed with trees No. (2-2) and (2-1). Other trees were in between.

c. Pollen tube elongation. "": "" "" o'l ("19 <; -1' The pollen tube was noticed with tree No. (3-4), while the optimum length was found with tree No. (2-2), followed by trees No. (3-3) and (2-1). Other trees gave satisfactory tube elongation.

111- Concerning early stages of flowering for different studied loquat trees, although most flowers were opened, other remained completely closed and did not shed pollens. Nevertheless, shed pollen gave no more than 50% pollen germination, whereas they showed 100% viability in acetocarmin test.

3- Tree fruiting a. The highest value of fruit set percentage was noticed with trees No. (3-11) and (2-4). No remarkable differences were noticed between other trees.

b. Referring to fruiting percentage, no clear trend was noticed in this respect, since tree No. (3-11) had the highest percentage of fruiting in the first season and noticeably low value in the second season. Other trees came in between in both seasons.

c. Regarding yield as kg. per tree, the highest yield was noticed with tree, No. (2-2), followed by trees No. (2-4), (3-11), (2-1) and (3-2) in descending order. Moreover, tree No. (3-3) gave the lowest yield.

d. As for number of fruits per tree, it followed nearly the same pattern of yield as kg. per tree for different trees.

e. In respect to yield as kg. per cm<sup>2</sup> of trunk. cross sectional area, grafted trees trees No. (2-2) and (3-4) showed the highest value in this respect. The least values in this concern were noticed with trees No. (3-2) and (3-3).

f. Concerning harvesting duration, trees No. (2-1), (2-4), (3-2) and (3-11) were similar. Meanwhile, fruits of grafted trees as well as those of tree No. (3-4) took longer harvesting duration.

4- Fruit quality

1- Fruit physical properties a. Considering fruit weight, tree No. (2-4) gave the lightest fruits. Meanwhile, the heaviest fruits were produced from tree No. (3-4). Other trees showed more or less similar values.

b. As for fruit length, tree No. (3-4) gave the tallest fruits. Nevertheless, tree No. (3-11) gave relatively short fruits. No remarkable differences were noticed among other trees.

c. Regarding fruit diameter, the widest fruits were produced from trees No. (2-2) and (2-4). On the contrary, fruits of tree No. (3-4) showed relatively the lowest value in this respect.

d. Concerning fruit index (LID), tree No. (2-4) gave comparatively the highest fruit index value. On the contrary, tree No. (2-2) gave the least value in this respect. Other trees were in between.

e. With respect to pulp percentage, the highest value of pulp percentage was observed with tree No. (2-4), followed by the grafted trees and tree No. (3-11). On the other hand, the lowest value of pulp percentage was noticed with tree No. (2-2).

f. In regard to pulp thickness, fruits of both trees No. (3-3) and (2-4) had relatively the highest pulp thickness, followed by those of grafted trees. Moreover, tree No. (3-11) showed comparatively the least pulp thickness. Other trees lie within the population in this respect.

g. Referring to number of seeds per fruit, the greatest number of seeds per fruit was produced from tree No. (3-3) followed by those of trees No. (2-1) and (2-2). Moreover, trees No. (2-4), (3-2), (3-4) and grafted trees gave not only the lowest but also similar values in this respect.

h. Considering seed weight, the least seed weight was noticed with tree No. (3-3). On the contrary, the highest seed weight was obtained with grafted trees. Other trees were in general similar in their values in this respect.

i. As for fruit colour, all studied trees varied in their fruit colour.

L, on Fruits of tree No. (2- were yellow, whereas, fruits of trees No. (2-2), (2-1), (3-4), (3-2) and grafted trees were yellow or orange in colour with different numbers of the Colour Chart. Moreover, fruits of trees No. (3-11) and (3-3) were orange in colour.

II- Fruit chemical properties a. The average of two seasons showed that the highest percentage of T.S.S. existed in fruits of tree No. (3-3). On the contrary, the lowest percentages of T.S.S. were obtained from fruits of trees No. (3-4) and (3-11). Other studied trees were in between in this respect.

b. Fruits of tree No. (3-3) were more acid in their taste. On the other hand, tree No. (3-11) developed fruits of the lowest value of acidity. Other trees were in between in this respect.

c. T.S.S./acid ratio of fruits of studied trees indicated that the highest value was observed for tree No. (3-11). In addition, tree No. (3-3) gave late maturing fruits. Other trees lie within the population

average in this respect-d. Fruits of tree No. (3-11) contained the highest amount of ascorbic acid, whereas the reverse was true when trees No. (2-2), (2-4), (3-2) and (3-3) were concerned.5- Evaluation of the loquat treesa. According to fruit quality (fruit weight, pulp percentage and the reduction of seeds per fruit), it could be concluded that fruits of trees No. (2-4), grafted trees and (3-2) are the preferable ones for the fresh consumption.b. Regarding evaluation of loquat trees through tree productivity (i.e. yield kg./tree), the studied trees could be arranged in descending order according to their actual superiority in this respect as follows :-Tree No. (2-2), (2-4), (3-11), (2-1), (3-2) and (3-4)