Physiological studies on growth and seed yiled of some citrus rootstocks

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The present investigation was carried out during the two consecutive seasons of 2000 and 2001 on the following Citrus rootstocks; i.e. Balady sour orange (Citrus aurantium, L.), Cleopatra mandarin (Citrus reshni, Hort. Ex. Tanaka), Volkamer lemon (Citrus volkameriana), rough lemon (Citrus jambhiri, Lush.), Rangpur lime (Citrus limonia, Osbeck) and Troyer citrange (Citrus sinesis x Poncirus trifoliata) over 15-year-old and planted at 5 x 5 m2 on a clay loam soil in the Agricultural Experimental Station of the Faculty of Agriculture, Moshtohor, Zagazig University, Benha Branch, Qalubia governorate.This investigation evaluated the characteristics of six Citrus varieties used as rootstocks for citrus cvs. These rootstocks were compared through the following characteristics: (1) Vegetative growth, (2) Tree fruiting (3) Seed yield (4) Leaf fresh and dry weight and dry matter percentage, (5) Leaf nutrient content (6) Seed characteristics, such as seed weight, seed polyemberyony, seed germination and germination rate (7) Seed content (8) Seedling growth.Furthermore, this investigation studied the morphological aspects of rootstock seeds and leaves either macromorphological such as shape, colour and size as well as, surface scan by Scanning Electron Microscope (SEM). According to seed and leaf macromorphology and surface scanning aspects by (SEM), an artificial key has been developed to help in separating and identifying citrus rootstocks under this study.The results revealed that1- Citrus volkameriana rootstock gave the tallest tree height. While, Troyer citrange and Balady sour orange rootstocks were the shortest ones.1442-Citrus volkameriana rootstock had the widest canopy. whereas, Rangpur lime and Troyer citrange rootstocks had the most narrow canopy. The results of vegetative growth of citrus rootstocks under study show that Citrus volkameriana rootstock grows vigorously. Meanwhile, Troyer citrange rootstock grows slowly. Consequently, those results gave an explanation for the stimulative effect of Citrus volkameriana rootstock on the growth of the grafted scion and the dwarfing effect of Troyer citrange rootstock on the growth of the growing scion.3-Cleopatra mandarin rootstock showed severe alternate bearing. The trees were carrying a full load of crop in season 2001 and the other way around in season 2000. Moreover, Citrus volkameriana rootstock was the most productive of yield kg per tree. While, Troyer citrange rootstock had the least yield kg per tree.4-Citrus volkameriana and Cleopatra mandarin (in the on year) produced the highest number of fruit per tree. On the other hand, Troyer citrange and Balady sour orange rootstocks born the lowest number of fruits per tree.5-Balady sour orange had the highest number of seeds per fruit. While, Rangpur lime and rough lemon rootstocks had the least number of seeds per fruit.6-Troyer citrange rootstock was the most productive of tree yield of seeds. whereas, Rangpur lime and rough lemon rootstocks had the lowest tree yield of seeds.7-Leaves of rough lemon and Balady sour orange rootstocks had the heaviest fresh weight. Meanwhile, those of Troyer citrange, Rangpur lime and Cleopatra mandarin rootstocks gave the least fresh weight.1458-Balady sour orange rootstock had the highest values of leaf dry weight. On the other hand, leaves of Troyer citrange and Cleopatra mandarin (in the off year) had the lowest values of dry weight.9-Citrus volkameriana and Cleopatra mandarin (in the on year) had the highest percentage of dry matter in their leaves. While, rough lemon and Cleopatra mandarin (in the off year) rootstocks gave the least percentage of dry matter in their leaves.10-Leaves of Citrus volkameriana rootstock were the richest ones in their nitrogen content. Meanwhile, those of

Cleopatra mandarin rootstock were the poorest in their nitrogen content.11-Balady sour orange rootstock had the highest values of phosphorus content in their leaves. While, Cleopatra mandarin, rough lemon and Troyer citrange rootstocks gave the lowest values of phosphorus in their leaves.12-Leaves of rough lemon rootstock had the highest concentration of potassium. On the other hand, Cleopatra mandarin trees had the least concentration of potassium in their leaves.13-Leaves of Citrus volkameriana were the richest ones in their calcium content. whereas, those of Cleopatra mandarin rootstock took the other way around.14-Citrus volkameriana rootstock was the highest values of magnesium content in their leaves. On the other hand, Troyer citrange rootstock recorded the lowest values of magnesium in their leaves.15-Seeds of Troyer citrange rootstock were the heaviest ones in their weight. Meanwhile, those of Rangpur lime rootstock took the other way around.