Physiological studies on citrus rootstock seedlings

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The present study was carried out during two consecutive seasons of 1999 — 2000 and 2000 — 2001 at the Experimental Station of the Faculty of Agriculture, Moshohor, Zagazig University, Benha Branch.Root-stock seedlings of three citrus rootstocks namely sour orange, volkameriana and cleopatra mandarin were the plant material used in this work which aimed to study the response of these rootstocks seedlings to different level and methods of biofertilization with effective microorganisms. Since, vegetative growth measurements of three rootstocks seedlings, leaf pigment content and leaf mineral composition were the main points subjected to be investigated in this respect.Six-month old seedlings of three citrus rootstock i.e. sour orange, volkameriana and cleopatra mandarin seedlings were transplanted on September 15th of both 1999-2000 and 2000-2001 seasons in perforated dark blastic bags each contained 5kg of unsterilized loam soil, kept under shade house conditions.In each season, effective microorganisms (EM) fertilizers were applied as soil or foliar application four times a year i.e. 1st November, 1St February, 1st May and 1st August at six levels (0,1%, 2%, 3%, 4% and 5%).Thus, factorial experiment was conducted to investigate the specific effect of 3 variables (factors) i.e. rootstock species; level of EM application (0, 1,2, 3,4 and 5%) and Methods ofeel 114 &a,applications (soil and spray), as well as interaction effect of their combinations. The complete randomized block design with (4)replication was used whereas each replicate was represented by 5 seedlings.Studies items:V-I- Vegetative growth in relation to effective microorganisms (EM) fertilization levels and method of application. V-II- Leaf chemical contents in relation to effectivemicroorganisms (EM) fertilization levels and method of application.V-II- 1 - Leaf pigment content.V-II-2- Leaf nutrients content.V-I- Vegetative growth in relation to effective microorganisms (EM) levels:1- Data obtained revealed obviously that the different growth parameters i.e. stem length, root length, plant height, stem diameter, number of leaves / plant, leaf area, number of roots / plant top fresh and dry weight, root fresh and dry weight, total plant fresh and dry weight as well as top root ratio of all citrus rootstock seedlings were positively affected by effective microorganism (EM) fertilization as compared to control during bothseasons of study regardless methods of application or level of EM applied.2-Concerning the specific effect of rootstock species on vegetative growth, volkameriana lemon rootstock seedlings showed generally the highest values of vegetative growth (stem length, root length, plant height, number of leaves / plant, stem diameter, leaf area, number of roots / plant, top, root, total plant (fresh and dry weight) conversely, Cleopatra mandarin rootstock was in the inferior in this respect.3-Concerning the specific effect of effective microorganisms (EM) fertilization level on vegetative growth, the obtained data showed that the EM fertilization at 4% or 5% greatly increased length of (stem, root) plant height, number of leaves and roots / plant, fresh weigh of top, root and total plant while, the 4% level EM gained rootstocks with greatest value of top, root and total plant dry weight.4-Foliar application showed generally the highest values for all vegetative growth parameters as compared with soil application except number of roots / plant, fresh and dry weight of roots which pointed out that soil application was more effective than foliar application in this respect.5-A significant interaction was found between rootstock species, EM level and method of application. Meanwhile, volkameriana rootstock fertilized with EM at 3% or 4% levels as foliar application showed the greatest values ofvegetative parameters except, number of roots / plant, root fresh and dry weight whereas soil application was more effective in this concern.