Effect Of Ibbigation And Potassium Levels On Growth And Minebal Content Of Some Citrus Rootstock Seedlings Grown On Calcareous Soil

Mohamed Deiab Eid El-Deeb

90 . SUMMARYThrough the years, there has been a continous rise in demand for citrus fruits for both local consumption and export. Accordingly, there have been a steady increase in the area planted with citrus. Suitable locations for citrus planting, within the Nile Valley and Delta are new getting scarce. Recent plans are developed to establish large citrus orchards on new land of different soil types generally characterized by low fertility and classified as sandy calcareous or saline.Research is needed to evaluate the performance of sour orange as well as other citrus rootstocks in thesenew areas, Furthermore, cultural practices, such as irriga-tion and fertilization need to be adjusted to suit such different soil types and conditions.Therefore, this experiment was carried out at the experiment31,station of the Faculty of Agriculture , Moshtohor, Zagazig University to study the effect of irrigation regime and potassium fertilization on the growth and mineralcontent of rough lemon and sour orange seedlings grown on calcareous soil (30 % Ca CO3) alluvial soil and synthetic calcareous media (a mixture of alluvial soil and Ca CO391to raise Ca CO3 equivalent to 30 %). Seedlings were transplanted in pots No 30 in March 1978 and 1979 and maintained for the two growing seasons. Seedlings of both rootstocks received twelve different treatments according to irrigation system, potassium fertilization and soil type on which they were grown. Two irrigation regimes were applied. (a) after the loss of the available water, pot were irrigated to raise soil moisture content up to the field capacity (extended interval) or (b)water wasapplied after a loss of 50 % of the available water enough to raise soil moisture up to the field capacity (short interval). Accordingly the irrigation interval in the short system was reduced to about one half, the interval of the extended irrigation regime.Fertilization with N and P were done uniformly to all pots. While potassium was applied at two levels as follow (a) pot did not receive K and (b) pots received 2.0 g.actual K/pot yearly.92The obtained results could be summarized as follow:-I- Vegetative growth : A significant increase invegetative growth (stem length, top dry weight, root dry weight, total dry weight) of both rough lemon and sour orange seedlings was resulted by either short irrigation interval or potassium fertilization when compared with seedlings treated by extended irrigation interval or didnot receive K fertilizer respectively during the two seasons of this study. Top: root ratio was also increased by K fertilizer with the two rootstocks, but the difference wasonly significant with rough lemon. Regarding the effect ofthe different treatments on vegetative growth, generallythe short irrigation interval+ potassium fertilizer wassuperior, otherwise the extended irrigation intervalwithout K fertilizer was the inferior with both tworootstocks in all soil types.Concerning the effect of soil type on vegetative growth, calcareous soil produced the lowest values when compared with either alluvial soil or synthetic calcareous media with both citrus species during the two seasons (1979,931980). Rough lemon grew better and gave more dry matter than sour orange in calcareous soil, while in alluvial soil they grew to comparable size.II- Leaf and root mineral content :- _ Regarding theeffect of irrigation interval on mineral content, results showed that, leaf and root mineral content of both rootstocks generally varied from one element to another, but results could be summarized under the following points:1-Nitrogen % was increased by the short irrigation interval in roots and leaves of both rootstocks. However, magnesium increased only with sour orange.2-Leaf

phosphorus content with the two rootstocks was increase in response to the extended irrigation interval.3-Irrigation interval did not affect root P content for the two rootstocks, Ca and Mg with rough lemon.4-Irrigation interval had no definite trend on K content with rough lemon, Ca in sour orange and leaf Mg content with the two species.5-Potassium content was increased in the leave, but decreased in the root of sour orange in response to the extended irrigation interval.94b In respect to the Potassium fertilization :-1 - N & K % were increased in leaf and root of the two rootstocks and phosphorus with only rough lemon in response to K application. However the same treatment decreased phosphorus in sour orange leaves and calcium leaf content,with the two rootstocks.2 - Magnesium in sour orange leaves and root of both rootstocks had no definite trend as affected by potassiumfertilizer.3 - Phosphorus in sour orange root, Ca in root of both two rootstocks, and Bilg in rough lemon leaves were notaffected by K fertilizer.4 - In general it could be concluded that, the short irrigation interval + K fertilizer treatment was superior to the other treatments in increasing N and K content,but P, Ca and Mg did not show any specific trend with anyof the different treatments.c.- Regarding the effect of soil type:-1 - No specific effect was detected due to soil type on N in rough lemon, P and Mg content with both95two tootstocks.2- Calcareous soil decreased N % in sour orange, while K and Ca were increased with the two rootstocksgrown in calcareous soil.Generally speaking, rough lemon is better adapted to calcareous soils than sour orange, short irrigation interval + K fertilization for rough lemon rootstock gave the best results when grown on calcareoussoil.