

University of Mosul
College of Agriculture and Forestry



**Effect of budding date and Chemical, Organic
and bio fertilization on budding success of
local orange and subsequent growth of the
seedlings**

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Ph.D.Thesis
Horticulture Science and Landscape Design
(Pomology)

Supervised by

Dr. Nameer N. F. Hadeed
Professor

2019 A.D.

1441 A.H

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and bio fertilization on budding success of
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**A Thesis Submitted
By**

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**In Partial Fulfillment of the Requirements for
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in
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Summary

The study was conducted in the lath house / Hort. Dept. /College of Agriculture and Forestry during 2018 season to study the effect of two spring budding dates (2 and 17 April) of local orange *Citrus sinensis* on sour orange seedlings *Citrus aurantium*, and adding of chemical fertilizer (NPK), organic fertilizer (Nutrigrreen) and the biological fertilizers (Biogeain, Potsiomag and Fulzyme) on the following growth of the budded seedlings. The studied factors were as follows:

- 1- Spring budding dates (2 and 17 April)
- 2- chemical fertilizer (0 and 30 gm.seedling⁻¹).
- 3- Seven levels of biological and organic fertilizers:
 - a- Zero.
 - b- Biogeain (3 and 6 gm.pot⁻¹).
 - c- Potsiomag (5 and 10 gm.pot⁻¹).
 - d- Fulzyme (1 gm.pot⁻¹).
 - e- Nutrigrreen organic fertilizer (6 ml.seedling⁻¹).

The study was performed by using split split plots within factorial experiment in randomized complete block design (RCBD), with 3 factors and 3 replicates, by using 5 seedlings for each treatment, so the number of seedlings will be $2 \times 2 \times 7 \times 3 \times 5 = 420$ seedlings. Treatment means were compared by using Duncan multiple levels at 5% p. the more important results obtained were as follows:

- 1- 2nd April budding date was superior significantly on 17th April date budding in budding success percent (44.76% and 31.42%, respectively). Also 2nd April budding date was effective significantly in vegetative growth characteristics (budding length, leaves number, leaves area, leaves wet weight, leaves chlorophyll content, leaves protein, carbohydrates and nitrogen percent. In contrast no superiority were noticed of the second budding date except in leaves dry weight, where, no significant differences were noticed in the other characteristics.
- 2- NPK addition had no effects on all of studied traits, as control treatment was superior in budding success percent, budding length, leaves number, leaves area, growth number, leaves chlorophyll content, leaves protein and carbohydrates content, leaves nitrogen and phosphorus percent and the available nitrogen and phosphorus in the soil, as compared with 30 gm.seedlings⁻¹ of NPK.

3- Addition of Potsiomag biofertilizer resulted in an increment in budding success percent and most of vegetative growth (budding length and diameter, leaves number, leaves area, leaves dry weight, leaves chlorophyll, protein and carbohydrates content), and root growth (dry weight and dry matter weight percent), leaves nitrogen and phosphorus percent and potassium content of the soil. Also biogain biofertilizer addition resulted in an increase in leaf area, leaves wet weight and available nitrogen of the leaves as compared with control treatment. While, fulzyme biofertilizer treatment recorded a significant increase in phosphorus content of the leaves and soil as compared with control treatment, which resulted in a significant increase in leaves sodium and soil pH.

4- Interaction between the factors resulted in a significant superiority in the studied characteristics, as the interaction between 0 NPK + 5 and 10 gm.pot⁻¹ of Potsiomag bio fertilizer for the first budding date seedling have the highest values of budding success percent, budding length and diameter, leaves number, leaves area, leaves wet and dry weight, leaves chlorophyll, protein and carbohydrates content, dry weight of the roots, leaves nitrogen and potassium content and available phosphorus and potassium content of the soil.