STUDIES TO IMPROVE GROWTH AND PRODUCTIVITY OF PLUM TREES UNDER DESERT CONDITIONS

By

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B. Sc. Agric. Sci. (Horticulture), Fac. Agric., Ain Shams Univ., 2003
M.Sc. Agric. Sci. (Pomology), Fac. Agric., Cairo Univ., 2012

THESIS

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Title of Thesis: Studies to improve growth and productivity of plum trees under desert conditions
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Dr. Atef Moatamed Hussien
Department: Pomology **Approval:** 8 / 7 / 2019

ABSTRACT

The present study was conducted on 6 years 'Sapphire' plum trees budded on Nemagurd rootstock through two successive seasons 2015 and 2016. This investigation aimed to 1) study the self and cross-compatability of 'Sapphire' cultivar, 2) determine chilling requirements and buds endodormancy stage, 3) identify the best hydrogen cyanamide application time to increase fruit set and yield, 4) determine fruit growth curve stages, to identify the pit hardening stage to be used at various horticultural practices, 5) effect of some boron treatments to improve fruit set and fruit quality, 6) evaluate some NAA treatments to increase fruiting and 7) study of nitrogen foliar spray application to increase fruit retention. Florescence microscope examination and hand pollination treatments showed that, 'Sapphire' cultivar is self-incompatible cultivar 'Pioneer' cultivar pollen grains are cross-compatible with 'Sapphire'.

'Sapphire' plum cultivar entered into endodormancy period in November 12th till February 16th in first season and in November 10th till January 19th in second season of the study. Dormex (commercial product containing 49% hydrogen cyanamide) application with 2% concentration at 60 and 50 days before expected bloom of 'sapphire' cultivar lead to bloom overlapping with 'Pioneer' cultivar and significantly increased fruit set and yield compared with control trees.

'Sapphire' plum fruit needed 13–14 weeks from full bloom until maturity stage, pit hardening period (stage II) needed 3 – 4 weeks and starts at 7 – 8 weeks after full bloom. After harvest 200 ppm and 300 ppm boron foliar spray application could be effective to enhance fruit set and yield in 'Sapphire' plum cultivar. Also, NAA at 20 ppm application can be used to increase fruit set and fruit retention percentage, also reduce fruit drop percentage and increase total number of fruit per tree to produce higher yield. Moreover, 1% ammonium nitrate foliar spray at 4 weeks after fruit set application is effective to reduce fruit drop and increase fruit retention.

Key words: 'Sapphire', plum, cross-compatability**,** hydrogen cyanamide, chilling requirements, boron, NAA, ammonium nitrate.

DEDICATION

I dedicate this work to my parents, my wife and children for all the support they lovely offered during my post-graduate studies.

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