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The Thesis Submitted for the Degree of M. Sc
(in the field of Production of greenhouse products)

The effect of seed pretreatment on the production of dragon fruit seedlings in different culture medium

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Abstract:

Dragon fruit is a perennial tropical plant that is propagated through seeds and stem cuttings. This research was conducted in order to investigate the effects of some seed priming treatments in different culture mediums on increasing the quality of seed germination in dragon fruit plants in the greenhouse of the Faculty of Agriculture of Zabul University. This experiment was done factorially and in the form of a completely random design with 3 repetitions and 10 seeds in each repetition. The investigated factors include variety in 2 levels (white and red dragon fruit numbers), seed pretreatment in 6 levels (seaweed extract, humic acid, mycorrhizal fungus, potassium nitrate, zinc sulfate and distilled water as control) and culture medium in 4 levels (perlite+cocopit+soil (1:1:1), perlite+vermicompost+soil (1:1:1), vermicompost+cocopit+soil (1:1:1), perlite+cocopit+vermicompost (1:1:1) The research showed Among the white and red dragon fruit cultivars, the white cultivar has the greatest effect on germination percentage (72. 5%), seed germination (47. 12%), germination speed (5. 65%), germination index (86%) 7. 7%), root length (6. 684 cm), fresh and dry weight of the whole plant (2. 26 and 0. 135 g), fresh and dry weight of the root (0. 44 and 402. g), fresh and dry weight of the stem (1. 81 and 0. 095 grams), ratio of fresh and dry weight of root to stem (0. 46 and 0. 261 grams), chlorophyll b and carbohydrates with averages of 1. 7 and 13. 47 mg/gram of fresh weight, respectively. seed During the application of humic acid pretreatment and the highest value of stem height and diameter with averages of 8. 55 cm and 1. 76 mm, respectively, and chlorophyll a (0. 344 mg/g fresh weight), total chlorophyll (0. 46 mg/g fresh weight) (fresh) carotenoid (0. 247 mg/g fresh weight) during the application of mycorrhizal fungus pretreatment, which was superior to the red variety. Perlite + vermicompost + cocopeat (1:1:1) culture medium was superior to other culture mediums for germination, establishment and growth of dragon fruit. The humidity was high. The pretreatment of mycorrhizal fungus is due to the increase in the level of absorption of nitrogen, iron and magnesium by mycorrhiza, and since these elements play a fundamental role in the structure of chlorophyll, it causes the photosynthetic pigments to increase significantly, and humic acid is due to the hormone-like properties of humic acid. During these properties, it increases the amount of phosphorus and potash elements, which in turn improved photosynthesis and increased the amount of sugar produced in the plant compared to other pretreatments, which increased the morphological, physiological traits and germination indicators.

Keywords: Dragon fruit, Priming, Mycorrhiza, Humic acid, Seaweed Extract