Evaluation Growth and Quality of Two Qatari Date Palm Cultivars derived from tissue culture by Using Organic Nutrient in greenhouse

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Abstract

Employing of organic agriculture has been essential for improving productivity of date palm plantlets as well preservation of environment. The present study is to focus on the improving date palm plantlets by employing organic compounds (Compost tea, humic acid, and bio-fertilizer) for safeguarding our environment, augmented demand for food and feed. In this investigation five treatments where done to plantlets derived from tissue culture technique, using aerated compost tea, humic acid, bio-fertilizers, mixtures of these three organic fertilizers and NPK as chemical fertilizer (control). The treatments were applied to the soil every 2 weeks for 9 months at concentrations mg/l as follow: 2g/l NPK, 100 compost tea, 100 compost tea+ 50 Humic acid, 100 compost tea+ 50 bio-fertilizer, 100 compost tea+ 50 Humic acid+50 bio-fertilizer). The results showed that, the plant height and stem base were amplified with the combination of CT100+ BF50 and CT100 +HA50 +BF50 respectively. The number of leaves and pinnate leaves became significantly increasing with the CT100+HA50 +BF50 .Cultivar shishi have significantly higher plants and number of leaves. While Nabit Saif have greater stem diameter and number of pinnae leaves. The combination of Compost tea, humic acid and Bio-fertilizer gives the paramount outcome of nitrogen in the soil, and this_improves the soil properties, structure and increase the availability of nutrients.

Introduction

Dates are an economically important crop in the Arabian Gulf, provides food, shelter and fuel to the communitie . **(Alshahib and Marshall, 2003; Chao and Krueger, 2007; Saafi *et al*., 2008**).

Fertilization is one of the important practices which increases date production and improves fruit quality (**Elamin,A.H et al., 2017**) .

Research done on the date palm showed that proper application of macro and micronutrient fertilizers is necessary to increase quantitative, qualitative and economic output of date production in palm groves (**Shaaban and Mahmoud, 2012**).

Organic fertilizers has multiple benefits towards balancing the nutrients, increasing microbial activity as well as preserving the environment in comparison with chemical fertilizers.

The aims of this study are:

- Preserving the environment
- Improving date palm plantlets obtained from tissue culture after acclimatization in greenhouse.
- Employing organic fertilization
- Evaluating growth promotion and the optimum levels of organic fertilization

Methods

This work was carried out under the greenhouse of the Qur'anic Botanic Garden and Tissue Culture Laboratory- Agriculture Research Department Doha, Qatar 2018-2019.

One-year-old, grown under the greenhouse conditions of date palm plantlets derived from tissue culture laboratory.

Plantlets were planted with mixture of peat moss: sand: perlite at a ratio (2:1:1) supplemented with five treatments as described in Table 1.

Treatments m[1]/L	Description
NPK	Nitrogen, Phosphorous, potassium (control)
CT100	Compost tea
CT100+50 HA	Compost tea + Humic acid
CT100+ BF 50	Compost tea+ Bio-fertilizer
CT100+ HA50+ BF 50	Compost tea+ Humic acid + Bio-fertilizer

Table 1: Treatments of Organic Nutrients

Results

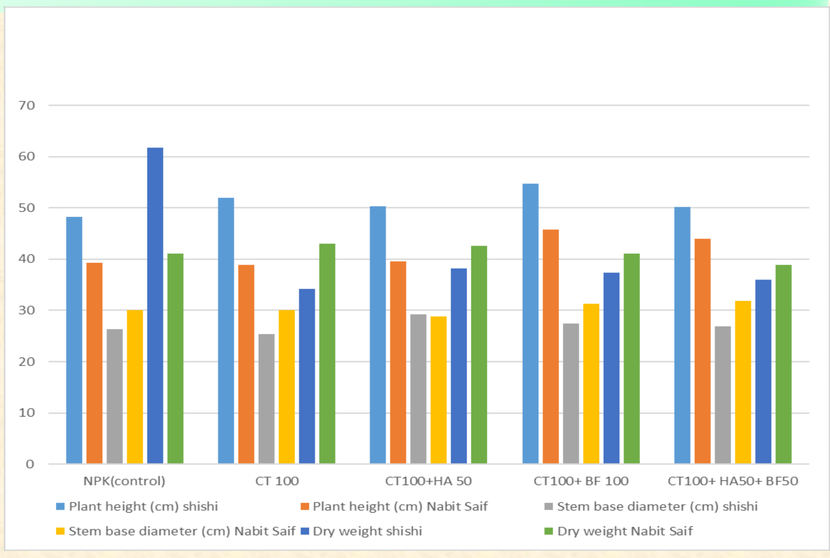

Figure1: Application of Organic nutrients on growth and development of date palm plantlets in greenhouse.

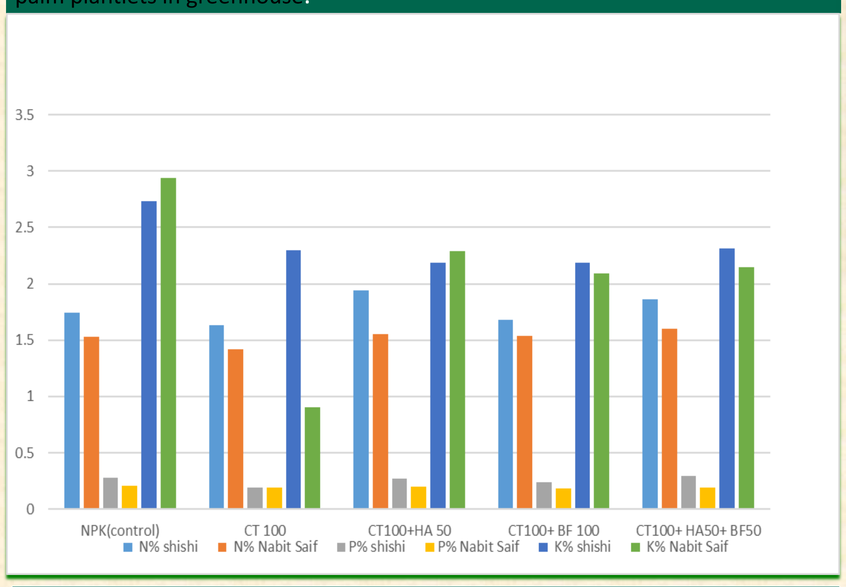

Figure 2:Estimatation of NPK on leaves of Shishi and Nabit Saif in greenhouse

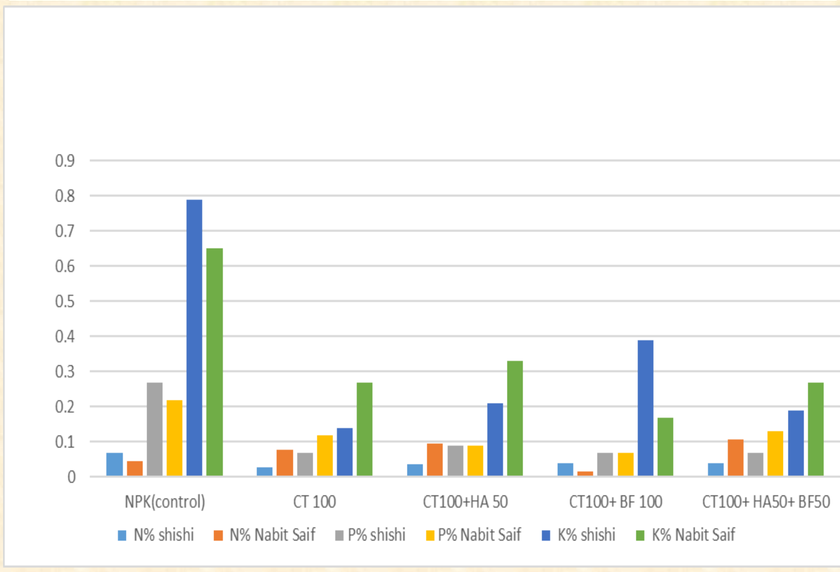

Figure 3: Estimation of NPK on soil of Shishi and Nabit Saif in greenhouse

Results and Discussion

The plant height and stem base were amplified with the combination of 100 compost tea+50 bio-fertilizer or 100 compost tea +50 Humic acid +50 bio-fertilizer respectively.

Cultivar shishi have significantly higher plants and number of leaves. While Nabit Saif have greater stem diameter and number of pinnate leaves.

Compost tea and humic acids fertilizers had increased nutrients N%, P% and K% of cultivar shishi.

The combination of compost tea, humic acid and Bio-fertilizer gives the paramount outcome of nitrogen in the soil, and this_improves the soil properties, structure and increase the availability of nutrients.

Effect of five treatments of organic nutrients on Date palm plantlets

Plantlets of date palm grown in greenhouse

Reference

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