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Evaluation the Effects of Different Levels of Phosphorous on Yield and Yield Components of Coriander (*Coriandrum sativum* L.)

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Abstract: In order to, evaluation the effects of different quantities of phosphorous on yield and yield components of Coriander (*Coriandrum sativum* L.) in Ghaemshahr region conditions, was performed the experiment in RCBD with 4 replications. Phosphorous treatments were consisting: 0, 10, 15 and 20 mg/kg pot soil from triple super phosphate fertilizer. In each pot were sowed 6 seeds in 2-3 cm depth and after seedling growth, was kept one healthy and vigorous plant. Results showed that application of phosphorous significantly increased all evaluated traits compared to control treatment.

Key words: Coriander · Triple Super Phosphate · Yield and Yield components

INTRODUCTION

Coriander (*Coriandrum sativum* L.) is the annual plant from Umberifera family with 90-120 days growth period that in many countries are culturing as spring plant and in some Mediterranean and east southern of Asia countries as winter plant. Besides, phosphorous is one of the vital elements for living beings survival that is sensitive to soil pH and have most useful in pH=6-6.5 [1]. Today's incorrect application of natural resource and irregular consumption of artificial materials such as mineral fertilizers in order to increase of production and harvest from agricultural lands, has been recognized as basic problem in environmental demolition and destruction of biological balance. Phosphorous has the role of structural, energy transfer and improvement of root growth and also adjusts the effects of extra nitrogen in maturity delay. Maurya [2] indicated that phosphorous lead to increase of leaf area index. Increase of leaf area index lead to enhancement of relative growth and production rate [2]. Admar *et al*. [3] found that phosphorous fertilizer with development of root and shoot lead to increase of vegetative yield in Coriander medicine plant. Aliabadi Farahani *et al*. [4] in evaluate of interactive effects of P supply and drought on root growth of the mycorrhizal coriander found that Arbuscular mycorrhizal fungi and P fertilizer significantly increased the root yield, root length, primary root dry weight and primary root length of coriander. Although the non-drought stress treatment significantly increased the root of coriander, the longest root length was achieved under the drought stress. Arbuscular mycorrhizal fungi are able to enhance the growth of coriander under drought stress through enhancing P uptake. This can have very important environmental impact through decreasing the amount of P fertilizer under control and drought stress conditions. Bharose *et al*. [5] in study on the effect of different levels of phosphorus and Sulphur on yield and availability of N P K, protein and oil content in Toria (*Brassica* sp.) var. p.t.-303 found that there was significant increase in %Nitrogen, %Phosphorus, % Potassium, %protein and oil content in treatment combination 50 kg Phosphorus + 40 kg Sulphur ha^{-1}) and followed by 25 kg Phosphorus + 20 kg Sulphur ha^{-1}), respectively over than Control. In many studies has been confirmed the influence of Phosphorus on growth and essence of medicinal plants such as Sharafzadeh *et al*. [6] on Sweet basil, Naderidarbaghshahi *et al*. [7] on German chamomile (*Matricaria chamomilla* L.), Nassar *et al*. [8] Saharkhiz and Omidbaigi [9] on Feverfew (*Tanacetum parthenium* L.) and also in

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Clustebeen by Yadav [10]. This investigation was performed with aim of evaluate the effects of phosphorous in Coriander plant and to find of best triple super phosphate level in Ghaemshahr region.

MATERIALS AND METHODS

This study was performed in randomized complete block design with 4 replications in Ghaemshar region of Mazandaran province of Iran in 2010. Phosphorous levels were consisting 0, 10, 15 and 20 mg/kg pot soil from triple super phosphate fertilizer. On basis of soil analysis, was added nitrogen fertilizer and potassium sulphate. The seeds were treated by fungicide and then were sowed 6 seeds in per pot in 2-3 cm depth which after seedling growth, was kept one healthy and vigorous plant. After complete the plant growth, was assessed essence percent by distill with water method, essence yield from product of essence percent in seed yield, oil percent by tetra chloride carbon solvent, oil yield from product of oil percent in seed yield, 1000 seeds weight, biologic yield product of seed straw harvested from plant, shoot number, umbel number in plant, seed number in umbel, harvest index from division of seed yield to biologic yield cross 100 and bearing rate from sum of seed and biologic yield with harvest index. Statistical analysis was performed by MSTATC software and means compared by Duncan's multiple range test.

RESULTS AND DISCUSSION

The results of mean compare by Duncan's test in 1% level showed that the highest 1000 seeds weight, seed yield, harvest index, bearing rate, percent and yield of essence and yield of oil was observed in 20 mg/kg phosphorous in pot soil and the lowest in control treatment. With increase of phosphorous level, these traits showed significant enhancement (Fig. 1 to 6).

In evaluate of biologic yield, shoot number in plant and oil percent, was observed significant different between different levels of phosphorous with control. There was not significant different between 10 and 15 mg/kg treatments. In relation to, umbel number in plant and seed number in umbel all phosphorous levels had significant different with control but there was not significant different between them (Fig. 1 to 6). Application of triple super phosphate significantly increased all measured traits compared with control. These results were according to Maurya [2], Aliabadi Farahani *et al*. [4] and Admar *et al*. [1] findings that explained application of phosphorous fertilizer increased vegetative yield of Coriander. Also these results are similar to findings of Bharose *et al*. [5] on Toria, Naderidarbaghshahi *et al*. [7] in German chamomile (*Matricaria chamomilla* L.), Saharkhiz and Omidbaigi [9] on Feverfew and Sharafzadeh *et al*. [4] 6on Sweet basil also obtained the best results in higher levels of phosphorus.

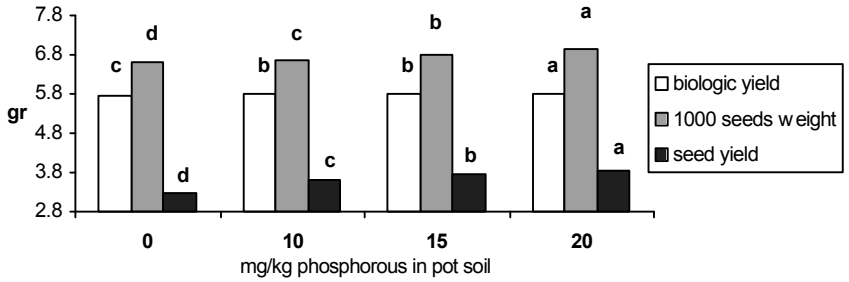

Fig. 1: Comparison the effect of different levels of phosphorous on biologic and seed yield and 1000 seeds weight

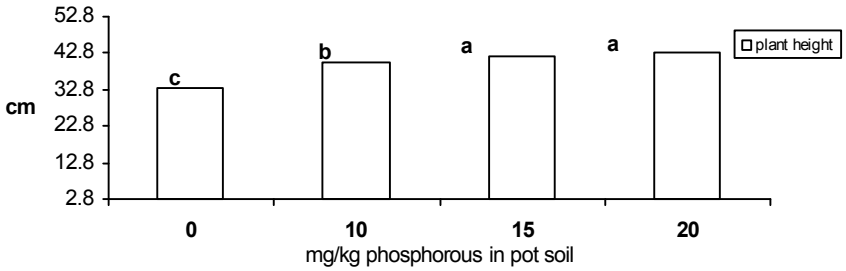

Fig. 2: Comparison the effect of different levels of phosphorous on plant height

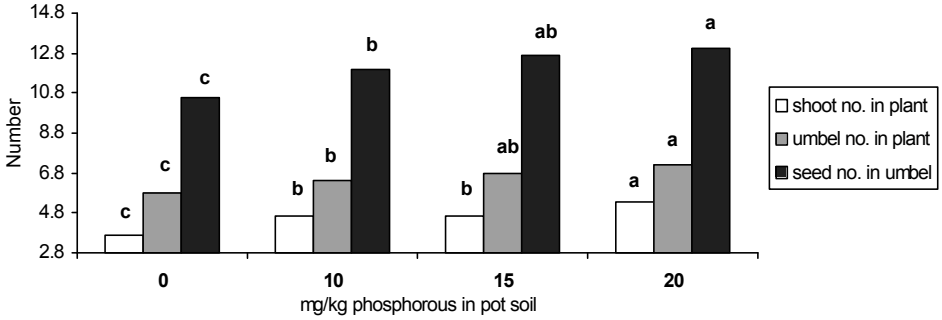

Fig. 3: Comparison the effect of different levels of phosphorous on shoot and umbel in plant and seed number in umbel

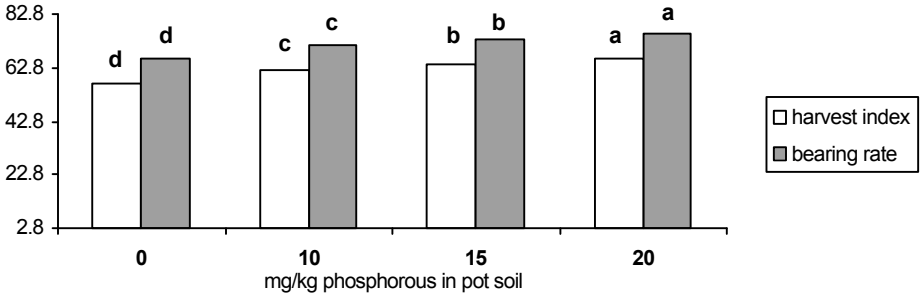

Fig. 4: Comparison the effect of different levels of phosphorous on harvest index and bearing rate

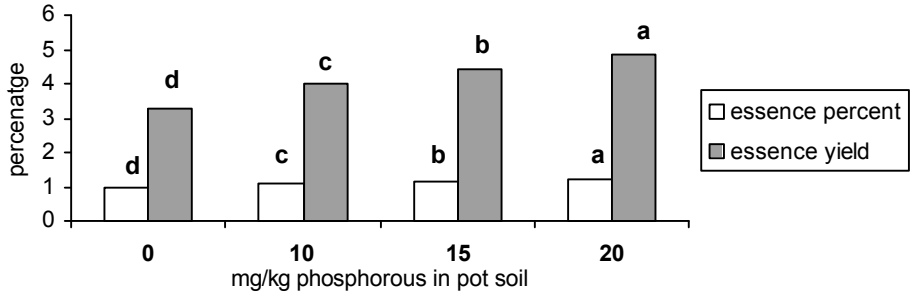

Fig. 5: Comparison the effect of different levels of phosphorous on essence percent and essence yield

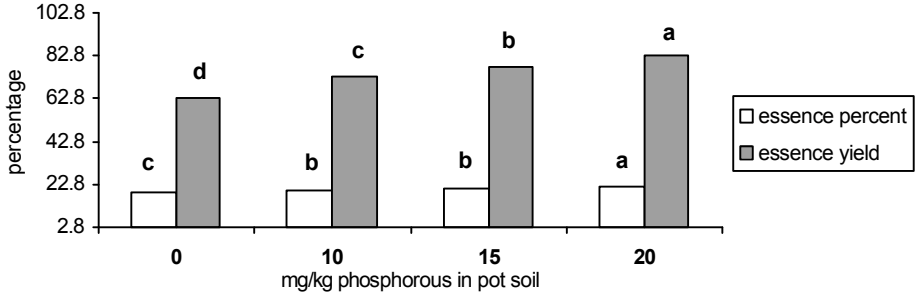

Fig. 6: Comparison the effect of different levels of phosphorous on oil percent and oil yield

REFERENCES

1. Sefidkon, F., 1999. Evaluate of essence in vegetative organs and fruit of Coriander. Journal of Medicine and Aromatic Research, 38: 13-32.
2. Maurya, K.R., 1989. Growth, yield and quality component in Coriander genotypes. Indian J. Hort., 46(1): 107-110.
3. Admar, K., M.K. Sadhu and M.G. Som, 2003. Effect of different levels of N on growth and yield of Coriander. Indian Agriculturist, 35: 107-111.

4. Aliabadi Farahani, H., S.A. Valadabadi and M.A. Khalvati, 2009. Interactive effects of P supply and drought on root growth of the mycorrhizal coriander (*Coriandrum* sativum L.). J. Plant Breeding and Crop Sci., 1(5): 217-222.
5. Bharose, R., S. Chandra, T. Thomas and D. Dhan, 2001. Effect of different levels of phosphorus and Sulphur on yield and availability of N P K, protein and oil content in Toria (*Brassica* sp.) var. p.t.-303. ARPN J. Agric. and Biol. Sci., 6(2): 31-33.
6. Sharafzadeh, S., M. Esmaeili and A.H. Mohammadi, 2011. Interaction effects of Nitrogen, Phosphorus and Potassium on growth, essence and total Phenolic content of Sweet basil. Advances in Environmental Biology, 5(6): 1285-1289.
7. Naderidarbaghshahi, M., S.M. Monemian, H. Zeynali and B. Bahari, 2011. Effects of different levels of nitrogen, phosphorus and potassium fertilizers on some agro-morphological and biochemical traits of German chamomile (*Matricaria chamomilla* L.). J. Medicinal Plants Res., 6(2): 277-283.
8. Nassar, A.H., M.F. Hashim, N.S. Hassan and H. Abo-Zaid. 2004. Effect of gamma irradiation and phosphorus on growth and oil production of Chamomile (*Chamomilla recutita* L. Rauschert). Int. J. Agri. Biol., 6(5): 776-780.
9. Saharkhiz, M.J. and R. Omidbaigi, 2008. The effect of Phosphorus on the productivity of Feverfew (*Tanacetum parthenium* (L.) Schultz Bip). Advances in Natural and Applied Sci., 2(2): 63-67.
10. Yadav, B.K., 2011. Interaction Effect of Phosphorus and Sulphur on yield and quality of Clusterbean in Typic Haplustept. World Journal of Agricultural Sci., 7(5): 556-560.