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Evaluate the Use of Organic Fertilizers on the Plant's Height and Size and Number of Micro Tubers Potato in Mahidasht of Kermanshah

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Abstract: *This study was done in order to evaluate the use of organic fertilizers (Vermicompost and Chicken manure) on the plant's height and number and weight of micro tuber Marfona cultivator potato (diameter of 25-35mm) with 2factors of vermicompost in 4levels (0,3,6and 9 ton/Hectare) and chicken manure in4 levels (0,10,12and 14Ton/Hectare) in the form of perfect randomly block with 3 replications in Mahidasht station of Agriculture research center and natural sources of Kermanshah province in 2013. The result showed that with increasing Vermicompost fertilizer, plant's height was reduced. Also highest number and weight of tubers with a diameter of 25-35mm belonged to 12Ton Chicken manure treatment without Vermicompost.*

Keywords: *potato, Marfona cultivator, Organic fertilizer, Vermicompost, Micro tuber.*

1. INTRODUCTION

Potato is one one-year split plant and grass which has gland and cultivated in 130 countries where 3 quarters of the world's population live in and in addition to the food consumption, it uses for preparation of more than 50 products such as : flour, bread, alcohol, cosmetics, confectionery, canned food, chips, Glucose and etc. The appropriate organic fertilizers, not only has Nitrogen but also helps to protect the health of environment. The research showed that the most important reasons that led to the adoption of organic products are the harm of using the pesticides and chemicals and adverse effects of these substances on products. Chicken manure in addition to haven nutrient, it has some features like gradual release of Nitrogen(Nitrate leaching loss), Potassium and Calcium (to reduce soil acidification) and organic matter (increase water and nutrient holding capacity). Using the Vermicompost in sustainable agriculture, not only helps to increase the protection and activities of useful micro organic of soil for instance: mercerize mushrooms and microorganism which solve the Phosphate in order to provide the nutrients for plant like Nitrogen, Phosphorus and soluble Potassium to improve the application and picking up the agricultural plants.

2. MATERIALS AND METHODS

This study is 4×4 factorial experiment based on complete randomized block plan with 3 replications was performed to analyze the usage of chicken manure and Vermicompost on plant's height, weight and number of tubers tin small size Marfona potatoes (diameter 25-35) 2factors of Vermicompost in 4 levels (0,3,6 and 9 Ton/Hectare) and Chicken manure in 4 levels (0,3,6 and9 Ton/ Hectare) were studied. To study the characteristics of 4 planted rows, 2 side rows were considered as a marginal effect. Sampling on plants was done with 2 middle rows by removing half a meter from the beginning and the end of each planted line. The plant's height was measured from the exit area of main stem from soil until the end of stem with choosing 2 bushes randomly by ruler to cm and the average of plant's height was recorded for every treatment. Also the standard boxes with dimension 25×25and 35×35mm were prepared. 2plants from recorded levels were passed from these 2 Cadres. Those tubers which passed from 35mm Cadre but did not pass from 25mm Cadre were measured. In fact, these tubers were bigger than the diameter of 25mm and they are smaller than 35mm, then the counting was

done with digital scale and the tubers weight refers to every treatment were measured with digital scale with Grams unit age and the average of 2plants were recorded, the data's were analyzed and variance by MSTAT-C software. Comparing the average treatment was done in Duncan's multiple range test with liability of (0.05). The average comparing graphs were plotted by 2010 Excel software

3. RESULT AND DISCUSSION

The result of variance analysis showed that the different levels of Vermicompost and Chicken manure had no significant effect on the height is of potato plant. The interaction of vermicompost and Chicken manure were not significant for this character. The result of average comparison showed that the different levels of vermicompost have significant differences. As the highest plant height (78cm) wide with no fertilizer (a0) and the lowest plant height (64cm) wide was cropped in 9Ton Vermicompost in per Hectare (figure1). But the simple effect of Chicken manure and Vermicompost fertilizer's interaction were not significant on the height of potato plant. Vermicompost fertilizer had a negative effect on the height of potato plant, so that with the use of Vermicompost fertilizers, the plant's height was reduced. Qasimkanlu and colleague (2009) showed using the biological fertilizer had 2 positive efficacies on the height of various potatoes and they are not correspondence with this research results. Nitrogen in organic fertilizers such as Vermicompost fertilizer during the plant's development gradually mineralized and becomes usable form for plants, so at the being of the plants growth, there is not enough Nitrogen for the remarkable period. That part of usable Nitrogen in potato plant was used in underground stems that probably for mentioned reasons using fertilizers has a negative effect on these characteristics. The result of variance analysis of tubers weight tiny sized seeds indicated that different levels of Vermicompost fertilizer and Chicken manure on tiny seed tuber had no significant effects, also the interaction effect of Vermicompost fertilizer and chicken manure were no significant for these characteristic. The result of average comparison showed that simple effect of vermicompost fertilizers on tuber weight in plant of this size had a significant influence, so that the highest weight of tubers on the small sized seed (63/25g) belong to the level without vermicompost fertilizers (a0) and minimum weight of tubers in each small size seed (30/21g) in the level of (a2) which had significant differences (figure2). There was no significant simple effect of Chicken manure but the interaction effect of Vermicompost fertilizer in Chicken manure was significant. so the highest weight of tubers with a diameter of 25-35mm (111/5g) in the treatment 12Tonof Chicken manure without Vermicompost fertilizer (a0b2) and the minimum weight of tuber in this size (18/24g) belong to the treatment of3Ton of Vermicompost without Chicken manure (a1b0) (figure3). In Qobadi and colleague/s experiment (Qobadi, 2011) the highest percentage of tubers with the diameter of smaller than 35mm related to the treatment of 200kg in Hectare the triple super Phosphate into the biological Phosphorus fertilizers. The research results indicated that the tubers with a diameter smaller than 35mm in potato are the most important increasing nonmarketable reason. In fact for having the good market potato, the number of these tubers should be reduced the tuber's uniformity of size, shape and being healthy potato tubers is the most important indicator of good market. The result of the analysis variance for the number of the tubers with the small sized seeds indicated the different levels of Vermicimpost fertilizers didn't have the influence on the tubers numbers but the Chicken manure's different levels have the significant influence ($p<o/o5$) on these characteristics.

There is no significant influence for this characteristic in the interaction effect of Vermicompost fertilizers on chicken manure. The result of average comparison showed that Vermicompost has the significant effect on the number of tubers. The highest number (2/99) in this size no fertilizer (a0) was significantly different in the compare with the surface (a3) which had the least number (1/73) (figure4). Also the simple effect of different levels in Chicken manure had the significant effect on this characteristic and the greatest number of tubers (2/81) with the diameter (25-35mm) at the level of 12 Ton of Chicken manure (b2) were obtained and of course there were no significant difference in the compare with the level of 10,14 Ton/Hectare (b1,b3)and the significant difference was observed in no Chicken manure (b0) which has the lowest number of number of tubers in the size (figure5). The interaction effect of Vermicompost fertilizer in Chicken manure with the diameter of (25-35mm) was significant. The highest number of tubers with (5/33) size belong to 12Ton treatment of Chicken manure without Vermicompost fertilizers (a0b2) and the lowest number of tubers (0/83) belongs to the treatment (a2b0).

1-According to the results, it seems that using the Chicken manure increase the number of tubers in this size but the moderate levels of Vermicompost fertilizers had the significant influence on the

reducing number of tubers in the size of 25-35mm that it is not suitable size for potatoes, in fact whatever the number and weight of tubers belonging to this size increase in can reckon as unsalable operation. In fact according to the result of this study the tubers weight and numbers were increased based on dominant way. Sharma and Arora Reported that Phosphorus fertilizer increased the operation with increasing the number and Wight of tubers. The combined use of bio fertilizers, organic and chemical fertilizers on potato caused the balance between source and tank (Sharma and Arora, 1987). So that the Phosphorus increased the tank's capacity (tubers number) and supplying the rest of the nutrient with Phosphorus through the integrated application of fertilizers increase the power sources (increase the amount of Asmylasion) (Farzana and Radizah, 2005), this result correspond with our research. Uniformity of size, shape and being healthy of tubers were the important indicators of marketability, using the bio fertilizers, organic and chemical fertilizers with the improvement of condition of potato tuber's condition for growth and nutrition which produce the uniform and healthy tubers that correspond with our result. Finally suggested that use the high level of Vermicompost fertilizers and Chicken manure and check the influence on quantitative and qualitative traits and using the other common statistics in the province of Kermanshah. It is recommended that and economic evaluation should be done for replacing of biological and organic fertilizers instead of chemical fertilizers and use procreated Chicken manure(Plate and Granular) and Vermicompost fertilizers with different diet, because the compound of ingredient depend on type of diet.

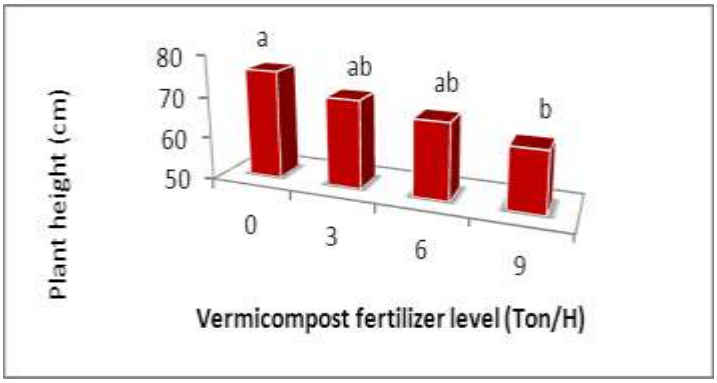

Figure1. *The main Effect of vermicompost fertilizer on potato plant*

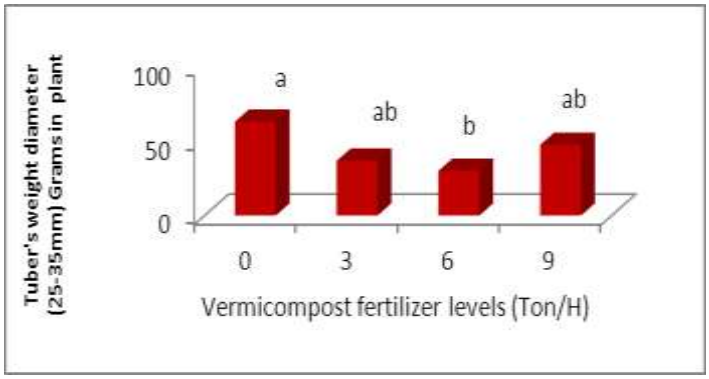

Figure2. *Effect of vermicompost fertilizer levels on tuber weight with the diameter (25-35 mm) in each plant*

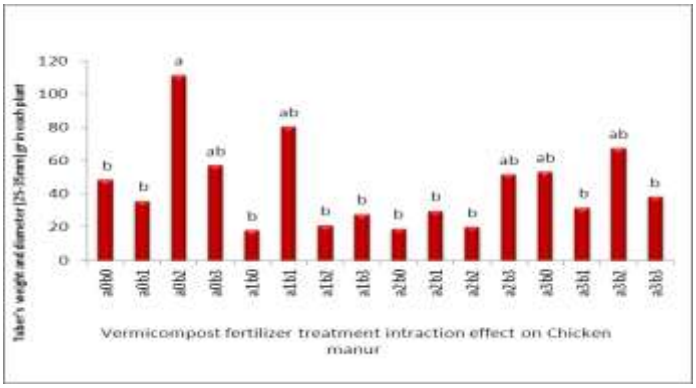

Figure3. *Interaction of Vermicompost fertilizer in Chicken manure on tubers weight diameter (25-35 mm) in each plant*

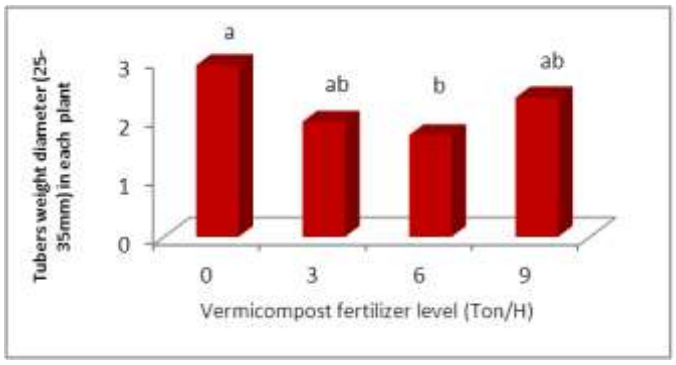

Figure4. *The simple effect of Vermicompost fertilizer levels on tubers number with diameter between (25-35mm) in each plant*

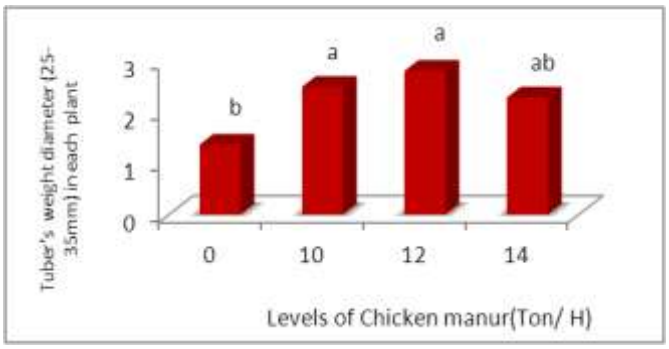

Figure5. *Simple effect of Chick manure on tubers number diameter (diameter between 25-35 mm) in each plant*

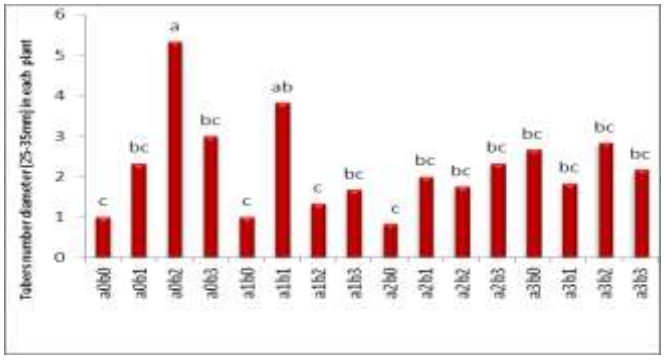

Figure6. *Interaction effect of vermicompost fertilizer in Chicken manure on tubers number diameter (between25-35 mm) in each plant*

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