



The effect of Compost, Vermicompost and Urea fertilizers on operation and operation facture on Pumpkin Msmayy (*Cucurbita pepo* L.)

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Abstract. Pumpkins belong to the cucurbit family (Cucurbitaceae) and include various types have three distinct types include pumpkin Msmayy (*Cucurbita pepo* L.), pumpkin (*Cucurbita maxima* L.) and Squash (*Cucurbita moschata* L.). This exam for the effect of urea, Compost and Vermicompost fertilizer on operation and operation facture on pumpkin Msmayy did in Shiraz Azad university research farm at April 2014. The factorial experiment in a completely randomized design with three replications. Traits such as number of nodes, distance between nodes, main stem length, and number of fruits per plant, fruit weight, fruit diameter, number of male and female flowers, respectively. The data using Excel and SAS software were reviewed and analyzed. The results of this experiment showed that the 1% level, compost makes a significant difference in the number of fruit, stem length between nodes, the distance between nodes, flowers and fruit weight were female. The male flowers are in the diameter of the fruit and vermicompost manure and compost will be significant. In total, more water and compost showed the greatest effect.

Keywords: Pumpkin Msmayy, Compost, Vermicompost, Urea

1. INTRODUCTION

Squash includes different kinds from which three distinct of it are Pumpkin Msmayy (*Cucurbita pepo* L.), pumpkin (*Cucurbita maxima* L.) and pumpkin (*Cucurbita moschata* L.) [1]. its origin is tropical and native regions of hot and dry areas [2].

The Pumpkin Msmayy, with its scientific name (*Cucurbita pepo* L.) belongs to the squash family (Cucurbitaceae). This one-year plant has lying down stems on the soil; oval or egg-shaped and flat leaves with largeness 15 cm to 30 cm and also yellow flowers in one genus [3]. Moreover, it's male and female flower are located on one stalk [4]. Squash is a summary, cylindrical and cucumber-shaped fruit. It has both sharp and sweet tastes together. This plant is existed in green and yellow colors [5]. The squash plant is a long-day plant and it needs light and high temperature during its growth period. Generally, it has low growth in temperature under 15⁰c or it doesn't grow forever. The color of seeds are dark green and without skin. The weight of each seed is 120-150 gr. Squash is relatively resistant against aridity by having deep roots. Also, this plant grows in all kinds of soils, but deep loamy soils and rich from nutritious substances whit acidic condition 5/5-6 are so suitable for its growth [6].

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Today, being assured of continuous and lasting production of healthy nutritious products along with protecting the environment and regarding social and economic occasions has been considered as a considrable subject in different sciences such as agriculture, ecology and environment by farmers, researches, governors and politicians. Using different sources of fertilizer can have considrable effects on the function and also quality of the products. In most of the constant agricultural systems and; especially, in biological agriculture, the composts, organic fertilizers and their extract are used in order to improve conditions, soil fertility and also to prevent and control plant diseases [7].

Composts are substances which are made during the analysis process of organic substances by micro-organisms in attendance of oxygen. Using compost is one of the ways for providing soil fertility. Compost is the source of organic substance which improves the protection capacity of soil humidity, increases the absorption of nutritious substances, increases the pseudo hormonal activity of plants, improves the ability of protecting water in the farming field, keeps the main and necessary substances of the wind, makes the soil to be thick and spongy and increases the activity of bacteria in the soil [8].

Another kind of compost is vermicompost. Vermicompost is, really, the obtained compost from decomposition operation of earthworms on the remnants and residues which not only it includes the corpses of earthworms, but also it includes bed substances and also organic residues in different steps of decomposition [9]. Some of the advantages, that vermicompost has, can be pointed out here: reforming the phisico-chemical and biological features of soil, including useful aerobic micro-organisms such as *Azotobacteria*, lack of having weeds, having motive substances for herbal growth such as vitamins; especially B_{12} , light and without any smell [10].

The experiment which was done by Samavat et al (2002) showed that chemical fertilizer and vermicompost had a meaningful difference on the number and weight of tomato in bush, weight of root and aerial organ [11]. Kelastin (1998) reported that compost and their extract activate the resistance mechanism against diseases in plants and they cause the resistance of plants to be increased against diseases and damages made by them [12]. In a farming research that was done on the medicinal plant of fenned, it was explicit that using 10 tons in one hectare of vermicompost causes number of flowers, height of bush, weight of one thousand bushes, biological function and the amount of plant's essence to be increased[13]. The investigations of Argoiloo et al (2006) show the considrable increase of function in the medicinal plant garlic due to the consumption of vermicompost. Arankon et al (2004) observed in an experiment that they did on the strawberry that vermicompost increased the dry weight, surface of the leaf, number of the running stems and number of flowers more than the chemical fertilizer meaningfully[14]. The purpose of this research has been the effect of consuming fertilizers on the function of Pumpkin Msmayy.

2. MATERIALS AND METHODS

Performing the designe was done in the researching farm of Islamic Azad University of Shiraz in April 2014. This farm has been located in length 29/76288 northern grade and width 52/48048 of eastern grade. The size of farm under research was 2000 m². This experiment was done in a factorial way and in the designe framework of a completely random block with three repetitions. For determining the necessary amount of urea fertilizer, the sample of farm's soil was discomposited in the laboratory and its macro and micro elements were recognized. On this

basis, the consumption rate of urea fertilizer was determined 25 Kg and the consumption rate of compost and vermicompost were determined 20 Kg for each one of them.

The cultivation bed was done in April through the preparation operation of the land and, at the end; the water pipes (tapelike, driplike) were located on the land. Three days before cultivation, the fertilizers (urea, compost, vermicompost) were added to the land and this land was irrigated 2 days before cultivation. Cultivation was performed in the date 17/04/2014 through the brook and mound. The seeds were cultivated with an interval 40cm on each row and 2 ones of every seed were cultivated in the depth 2-3cm of the soil and due to the sensitivity of soil to the die bush, cultivation was done on the mounds. The land was irrigated for two days and the seeds became green in 24/05/2014. After being green, the weak bushes became sparse and the strong bushes were protected. 40 days after the seeds becoming green, the harvesting operation was started and it was continued until the first week of August. Harvesting from each bush was done in a random way, (Figure1).



Figure 1. Harvesting courgette from the farm

The measured features includes: number and length of the mid-gnarl, number of male and female flowers, length of the main stem, number of fruits in a bush, function of fruit in the bush, diameter and weight of the fruit. The data were investigated and analyzed by SAS and Excel soft wares.

3. RESULTS AND DEBATE

In this experiment, it is observed that the lowest length of stem is without using fertilizer and this decrease was compensated by using compost and vermicompost and usage of urea fertilizer didn't have any meaningful effect on the length of stem, (Figure2).

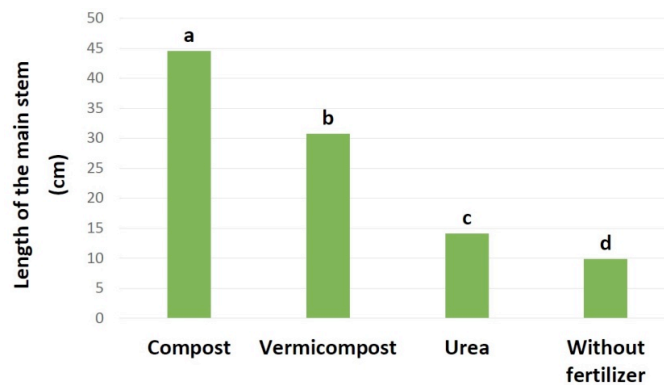


Figure 2. The effect of all kinds of fertilizers on the length of the main stem.

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The results of Keeling et al (2003) also show that using vermicompost fertilizer causes the development of root and growth of plant to be both increased [15]. Also, another reason of the increase in growth and length of stem was reported by Mycin et al (2010) that the pseudo-hormonal activity of compost causes the growth of root and plant to be increased [16]. Atiyeh et al (2000) also reported in their experiment that the growth features of plant and the dry weight of plants, which have been grown in the medium consisting of vermicompost, are observed much more [17]. In this experiment, the highest length of stem in the treatment was observed by using compost which the highest length of mid-gnarl was also observed in this treatment. Therefore, it can be concluded that the increase of stem's length is caused by the increase of mid-gnarl length and number of gnarls in the stem, (Figure3 and 4).

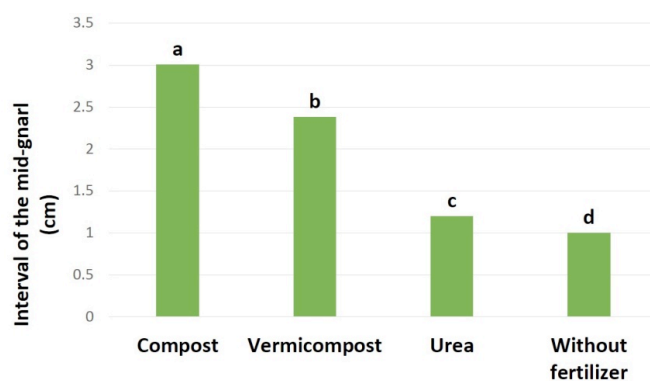


Figure 3. The effect of all kinds of fertilizers on the interval of the mid-gnarl.

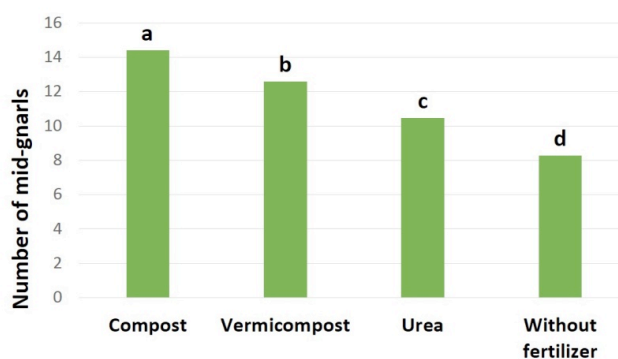


Figure 4. The effect of all kinds of fertilizers on the number of mid-gnarls.

The results of this experiment showed that the effect of vermicompost and compost has been more than urea in making the number of female flower. The highest number of female flowers was observed in the conditions of using compost which was concluded in an increase in the number and function of the fruit, (Figure5).

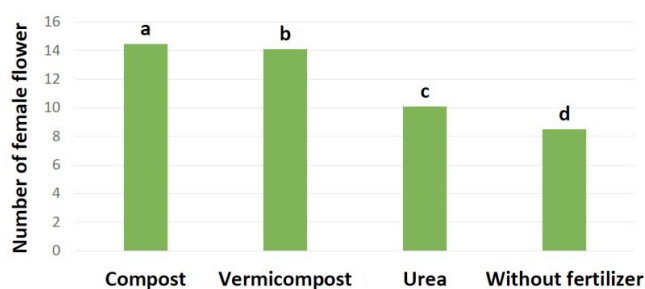


Figure 5. The effect of all kinds of fertilizer on the number of female flowers.

Using three kinds of fertilizers caused the number of male flowers to be increased meaningfully; of course, it seems that usage of urea fertilizer and vermicompost has lower effect than other fertilizers. The reason of the lower effect of urea fertilizer can be considered the lower availability rate of nitrogen in urea fertilizer than the other fertilizers; moreover, all of the low used and much used elements are existed in vermicompost fertilizer and compost fertilizer which causes the number of flowers, growth and function of squash plant to be increased; while, in urea fertilizer, only the effective element nitrogen is existed, (Figure6).

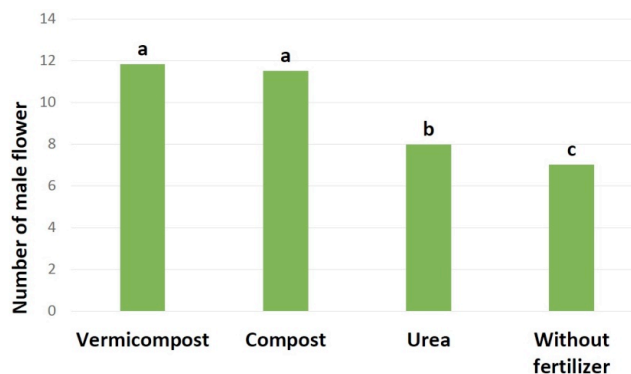


Figure 6. The effect of all kinds of fertilizer on the number of male flowers

In confirming the results of the present research, Liok and Penk (2005) observed that usage of compost causes number and action of flowers to be increased and it is expressed of desirable effects that compost has on the physical, chemical conditions, microbial and biological features of the medium, adjustment of acidic condition and increasing the protection capacity of water in the root’s environment. The desirable effect of vermicompost, regarding the compost, is due to the relatively high amounts of nutritious elements (Jat and Ahlavat, 2008). In this experiment, it was observed that using vermicompost fertilizer has had much more and better effect than the other fertilizers on the production of male flowers. Also Jooshi and Paloyg (2010) found that vermicompost has a higher bacterial activity than compost due to the existence of fungus, bacterium and yeast which these small creatures can have positive effect on the growth and function of plants in addition to improving the absorption of nutritious elements via producing the regulators of herbal growth.

Number of fruits under the conditions of using compost and vermicompost has caused the number of fruits to be increased proportionate to the witness treatment and; however, the urea fertilizer which has caused number of fruits to be increased proportionate to the witness treatment, but it has caused number of fruits to be decreased proportionate to the compost and vermicompost fertilizers, (Figure7).

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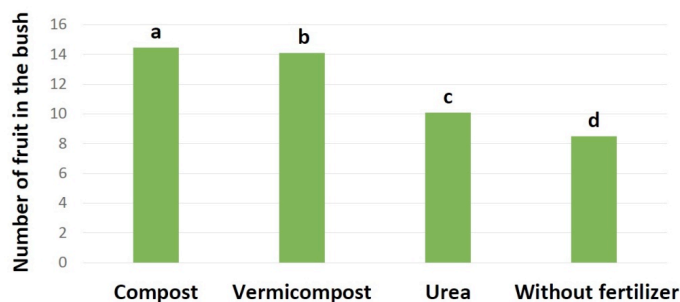


Figure 7. The effect of all kinds of fertilizers on the number of fruits in the bush

Increase in the number of fruits “strawberry, cucumber and eggplant” by using vermicompost has been reported by Azarmi et al (2009), Moraditochae et al (2011) and Singh et al (2008). The results obtained from this experiment express this matter that the diameter of the fruit causes the diameter of squash fruit to be increased in conditions of using three kinds of the studied fertilizers in this experiment; but compost and vermicompost have shown much more effect on the fruit, (Figure8 and 9).

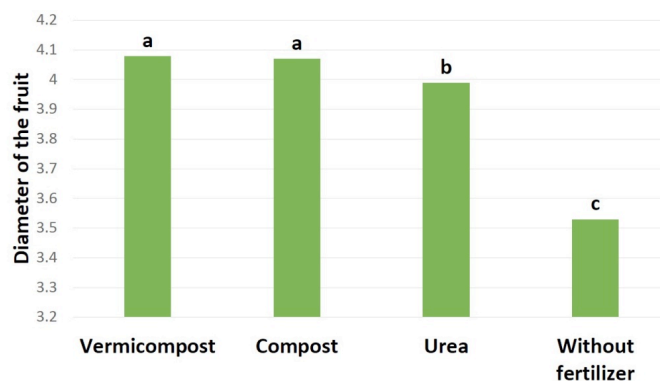


Figure 8. The effect of all kinds of fertilizer on the diameter of the fruit.

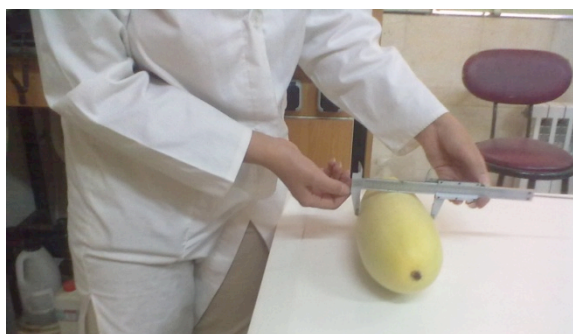


Figure 9. The effect of compost and vermicompost fertilizers on the diameter of fruit.

The results showed that compost fertilizer had more effect on the weight of the fruit than the other fertilizers, (Figure 10 and 11).

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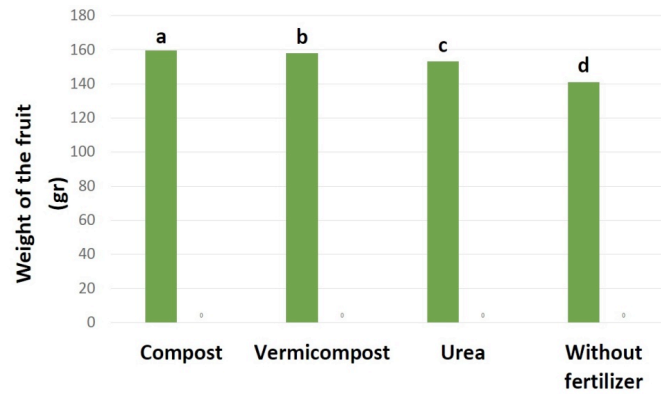


Figure 10. The effect of all kinds of fertilizer on the weight of the fruit.



Figure 11. The effect of compost fertilizers on the weight of the fruit.

The general result which was obtained from this experiment was this matter that compost showed the highest effect from itself regarding the rest of fertilizers.

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