Effect of some agricultural residues on the characteristics of growth and yield of the onion bulb (Allium cepa L).

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Abstract

the study was conducted at the primary school farm in Rabbah zone during in 2016/2017 season, To evaluatethe contribution of fram residues (palm residues, Peanut Peels, cooked tea leaves) in vegetative growth and the bulb onion in addition to the total yield of onion plant.

An investigation was a randomized complete block design in three replications. The obtained results of experiment showed that:

- Application of fertilize by cooked tea leaves were significantly better in of the studied characters (plants height and Leaves Area) with rate increased to 47.15% and 93.4% respectively, than control treatment. Followed by T1 and then T3.
- Peanut Peels treatment gave the largest number of tubular blades in the plant(12.33), the diameter of the bulb neck(13.48mm) and bulb Length(7.35cm) than other treatments. Followed by T2 and then T3.
-cooked tea leaves plants gave highest diameter of bulb(5.42cm), highest bulb weight(66g) and yield(20.85 t/ha) in the season. where Achieving with T1(18.35t/ha) significantly increase in the yield total in comparison with other treatments.

Keywords: Onion, Farm Residues, vegetative growth and yield.

INTRODUCTION

The large expansion of agriculture increased the accumulation of waste of cultivated crops, which cause environmental problems.

The Souf region is one of the most important areas of the greens production (tomatoes and potatoes), addition to peanuts and the date palm cultivation, where is the production respectively in the year 2016 to (1785, 11180, 50.4) Thousand quintals, In the year 2016, the palms number is 3704300 palms and the production of dates is about 2533.1 thousand quintals (DPSB, 2017). Also, The region is characterized by the high consumption of green tea.

The agricultural activity leaves many quantities of waste that are destined to burn or accumulate in the soil, making it the seat of the insects and ... as well as the plastic bags. causing environmental pollution.

The Agriculture Clean and Health aims to increase crops Environmentally friendly with developing the physico-chemical soil characteristics using organic residues as a fertilizer. The fertilizers differ in the decomposition speed, the chemical composition and availability of plant nutrients (NOSB,. 1995).

Onion is one of important horticulture crops in the worlds, however in Algeria, economically and medically (ARAB., 2015). (Shrestha, 2007). The Onion bulb contains high nutriment and medical composition proportions (antioxidants) such as quercetin. (Patil et al, 1995).

Using the organic fertilizers (animal and plant remnants) is not harmful to humans and the environment, environments protection is one of the most important researches filed. In this context, this study aims to studding the remnants plant effect on the growth and yield of onion plant (Allium cépa L).

MATERIALS & METHODES

Materials And Methods

The experiment was conducted out in Robbah in El Oued city (33°16'47" N, 6°54'35" E, 87m altitude).The experiment was carried out on a Randomized Complete Bloke Design (RCBD), The experiment consisted of four treatments of manure (T0:control, T1: Palm waste, T2: Peanut Peels, T3:Post-cooked tea leaves) with three replications at a spacing of 50 cm between blocks and treatments, respectively. Homogeneous seedlings. The distance between seedlings was 15 cm.

Observations were taken from 4 randomly selected plants from each sub-treatment to measure vegetative traits on growing periods and yield traits for the plants of Onion (Allium cepa L) on local var. the following: (the leaves area, the plants height, the stems number, mean bulb weight, the yield, diameter bulb and bulb length). The statistics analysis of variations ANOVA was made to determine the signification between the averages; it was compared by the use of LSD with 0.05 probability level.

RESULTATS ET DISCUSSIONS

The plants height

Generally, the plant growth is expressed by leaves and stems characteristics. The result indicates the onion plants length is depended by the type of fertilizer (figure-1). Plant height has significant difference in both Peanut peels, post-cooked tea leaves and palm waste compared with the control, 80 days after transplantation. where Post-cooked tea leaves treatment gave a highest length (43.17 cm) then followed by the peanut peel (42.17 cm) then the Palm waste treatment (30.53 cm).

The leaves area

The field experiment results (figure-2) of different manure treatments showed a difference in the leaf area and its rate growthn during 80 days after planting seedlings process. The treatments T1and T2 showed significant variation in the area leaf when compared to respective control treatment, . There was also no significant difference compared T3 treatment. This finding is in accordance with observation Alam et al., (2007) that the vermicompost and chemical fertilizers has increased vegetative characteristics of the potato plant. Ghemam a et senossi. (2013) have reported that manure organic casts increases the rate growth. As well as the results of both sun et al (2009) and Gebory et klhafagy (2011).

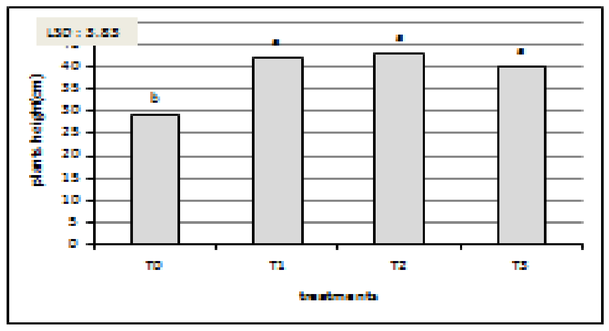

Figure -1. Effect of organic manure on the height of Onion plant (*Allium cepa* L)

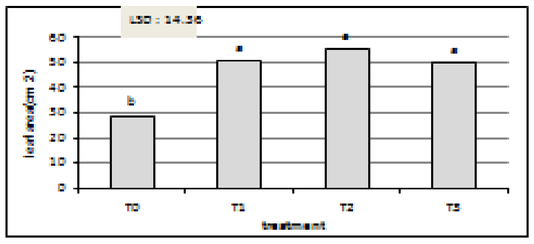

figure-2. Effect of organic manure on the leaf area and rate growth on (*Allium cepa* L).

The number tubuler blades / plant

The results figure - 3 of showed a difference in the number tubular blades in onion plant by different types of plant waste.The number of tubular blades increased in all treatments manures which was significant compared to respective control (T0). After 60 days the treatment T2 showed significant variation in the number of tubular blades compared to respective other all treatments, the number of tubular blades of the onion increased up to 12.33 blade/ plant and (10.83, 10.92) in T2 and T3 Respectively, which was lower compared to the control treatment (T0) Despite the small number of tubular blades.

The diameter of bulb neck

The results shown in (figure -4) revealed that the exploitation of the various plant waste resulted in variation in the diameter of bulb neck in the onion plant.

The Results after 60 days of planting seedlings indicate a significant increase in the diameter of the bulb neck at T1 and T2 as compared with the control. Where the largest diameter of the bulb neck was recorded in T1 (13.48mm), also the results showed difference in the rate of increase diameter of the bulb neck between fertilize treatments and control treatment. Where the highest increase observed was for diameter neck of the bulb in T1, (150.1%) then it is followed by both the Palm waste treatment at (111.55%) then the peel peanut treatment at (90.89%).

Characteristics yield of the Onion plant

Figure 5 shows a significant increase in T1 and T2 for all characteristics (bulb weight and total yield) compared to T0 control with no significant increase for T1 in weight The results showed a significant increase in T2 and T2 for total productivity compared with T3. The results also showed a significant increase in T2 relative to the weight of the bulb compared with the treatment of waste in the brain (T3).

The percentage of bulb weight in fertilization treatments is estimated at 156.36%, 175.28%, 123.86% respectively T1, T2, T3. The overall yield ratios were in the same order (169.66%, 192.77%, 124.84%). A similar result was also found by Yoldas et al. (2011) found the best result of organic fertilizer. The root of the plant activation system and the living roots that stimulate plant growth and nutrient uptake (Arisha et al., 2003; oueda et mahedeen, 2008), which increases onion productivity. A similar result was also reported from Jayatilake et al. (2003). They reported increased use of compost and increased lamp diameter for Sankar et al. (2009), Mandal et al. (2013) and Brinjh et al. (2014).

(Donald et al., 2001) This increase has a positive effect on photosynthesis rates, metabolic processes of plant organic compounds, elongation of cells and division (Fatideh), which is a source of many micronutrients and micronutrients. and Asil, 2012; Soleymani and Shahrajabian, 2012). Thus increasing the bulb bulb's onion bulb height in the best cure for tea leaves.

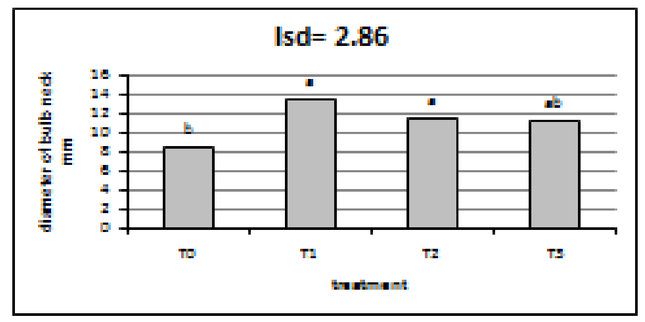

figure-3. Effect of organic manure on the number tubuler blades and its rate increase on (*Allium cepa* L).

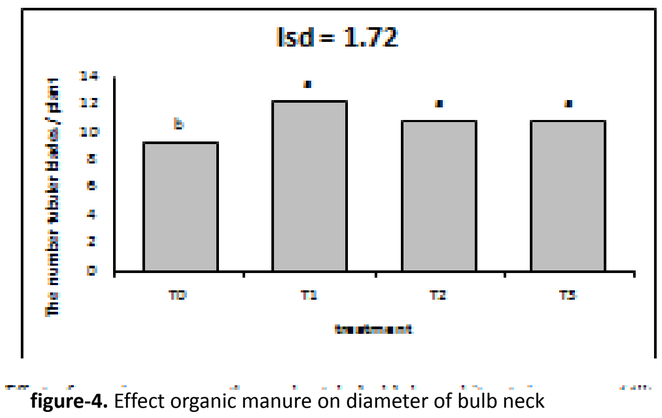

figure-4. Effect organic manure on diameter of bulb neck (mm) in onion plant (*Allium cepa* L.)

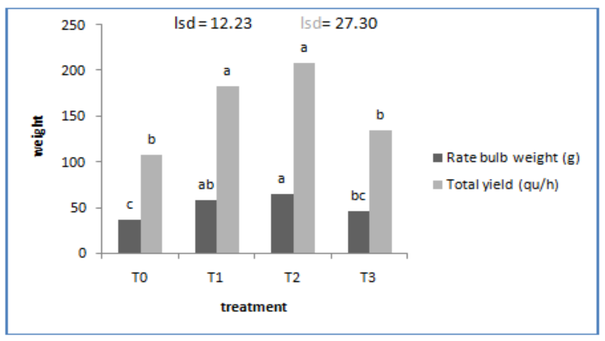

figure-5. Effect organic manure on bulb characterizes and yields in plant onion (*Allium cepa* L.)

CONCLUSIONS

This study concludes that the addition fertilizer plant residues improve the qualities of growth and production plant onions cooked tea leaves were the best one effect on the leaves area, the plants height, rate bulb weight and total yield

RÉFÉRENCE

Alam M N , Jahan M S , Ali M K , Ashraf M A and Islam M K. 2007. Effect of vermicomposting and chemical fertilizers on growth, yield and yield components of potato in Barind soils of Bangladesh. J. Appl. Sci. Res. 3: 1879-1888.

Al-Gebory K D H and Al-Khafagy A M H. 2011. Effects of Some Organic Fertilizerson Growth, Productivity and Leaf Content from N, P, K Elements of Onion Plant. K. J. gric. Sci. 3(1): 47-55.

ARAB. 2015. Agricultural Statistics Year Book. Vol. No. (35).

Arisha H M E , Gad A A , Younes S E. 2003. Response of some pepper cultivars to organic and mineral nitrogen fertilizer under sandy soil conditions. Zagazig Journal of Agricultural Research. 30: 1875-1899.

Brinjh S , Kumar S , Kumar D and Kumar M. 2014. Effect of integrated nutrient management on growth, yield and qulity in onion, cv. PusaMadhavi, Plant Archives. 14(1) : 557-559.

Direction de la Programmation et du Suivi Budgétaires (DPSB). 2015. Monographie de la wilaya d'El-Oued 2014.

Donald D H, Essington E, Joanne L, Roland K and Wyveta M. 2001. Phosphorus and Potassium Fertilization of Disk-Till and No-Till Cotto, the Journal of Cotton Science. 5(3): 144-155.

Fatideh M M and Asil M H. 2012. Onion yield, quality and storability as affected with different soil moisture and nitrogen regimes. South-Western J. of Horti. Biology and Environment. 3(2): 145-165.

Geonames. 2017. www. Geonames.org.

Ghemam A D , and Senoussi M M. 2013. Influence of organic manure on the vegetable growth and tuber production of potato (*Solanum Tuberosum.* L Varspunta) in a sahara desert region. Inte. J. Agri. Crop Sci. 5(22): 2724-2731.

Mandal J , Ghosh C and Chattopadhyay G.N. 2013. Proportional Substitution of Chemical Fertilizers with Vermicompost on Growth and Production Potential of Onion (*Allium cepa* L.) Int. J. Bio-res. and Str. Man. 4(2): 356-357.

National Organic Standards Board (NOSB). 1995. Definition of organic. Drafted and passed at April 1995 meeting in Orlando, Florida.

Ouda B A , Mahadeen A Y. 2008. Effect of fertilizers on growth, yield, yield components, quality and certain nutrient contents in broccoli (*Brassica oleracea*). International Journal of Agriculture and Biology. 10(6): 627-632.

Patil B S., Pike L. M and Yoo K. S. 1995. Variation in the quercetin content in different colored onions (*Allium cepa* L.). J. Amer. Soc. Hort. Science. 120(6): 909-913.

Sankar V , Veeraragavathatham D and Kannan M. 2009. Studies on organic farming in onion (*Allium cepa* L.) for the production of export quality bulbs. The Asian Journal of Horticulture. 4(1): 65-69.

Shrestha H. 2007. A Plant monograph of Onion (*Allium cepa*). The School of Pharmaceutical and Biomedical Sciences Pokhara University, Simalchaur, Pokara, Roll No. 11/2004.

Soleymani A and Shahrajabian M H. 2012. Effects of different levels of nitrogen on yield and nitrate content of four spring onion genotypes. Inter. J. of Agric. Crop Sci. 4(4): 179-182.

Sun Y P, Zhang Z.P and Wang L J. 2009. Promotion of 5- aminolevulinic acid treatment on leaf synthesis is related with increase of antioxidant enzymes activity in watermelon seedlings grown under shad condition. Ph. Synth. 47(3): 347-354.

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VOISIN A R. 2004. Le Souf monographie. Ed. EL-WALID. p. 319.

Yoldas F, Ceylan S, Mordogan N and Esetlili B C. 2011. Effect of organic and inorganic fertilizers on yield and mineral content of onion (*Allium cepa* L.). Afr. J. Biotec. 10(55): 11488-11492.