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Investigation of the effect potassium and zinc sulfate levels on quality and quantity yield Admiral F-1 HYB variety onion (*Allium cepa* cv. Admiral F-1 HYB)

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ABSTRACT: To investigation the effect of zinc and potassium sulphate fertilizers on on quality and quantity yield of onion variety Admiral figure F-1 in the second layout Jiroft in year crop cultivation 2015 experiment of factorial randomized complete block design was carried out, Where the effect of zinc sulfate fertilizer as a factor A in 4 levels (zero, 20, 30 and 40 kg/ha) and potassium sulfate as a factor B in 4 levels (zero, 50, 100 and 150 kg /ha) . To increase in the soil to the plant was considered in 2 phases. Fertilizers such as nitrogen and phosphorus and other nutrients to plants based on soil test was used. The results showed that the interaction between potassium and zinc sulfate on most of the traits were significant at the 1% level of statistical probability. of potassium sulfate 150 kg/ha and zinc sulfate 30 kg / hectare, the highest rates were observed in the traits of the species in the treated plant height (90/56 cm), weight bulb (162.62 g), shoot dry weight (72.12 mg), TSS (13.36 ° Brix) and yield (65052.24 kg per hectare) Maximum size compared to other treatments. And even the application of potassium sulphate 40 kg/ha and 150 kg/ha was also at a higher level. Control treatment had the lowest rate of traits.

***Keywords*:** onion, potassium sulfate, zinc sulfate, yield.

INTRODUCTION

In such a way that the current consumption of human food vegetables raw, cooked, canned, dried and spices in the fall. Some vitamins and enzymes essential for the human body, not by the body itself, and not through animal food supply, but also vegetables, fruits, and generally herbs suppliers are in the body. Thus, man to maintain their health and avoid many diseases in the world today machine, with it, the vegetable consumption has, therefore, to be able to satisfy these needs, in the outskirts, inside their homes and farms the farm's vegetables (Journal, 2008). Therefore, cultivating with proper nutrition in addition to increasing crop yield, is very effective in preventing waste of resources. And use of biological and mineral fertilizers in combination can be effective in conserving the proper application of these fertilizers. Onions are one of the products that are on a daily basis, can have a role in human nutrition and its economic production, plant nutrition should be the preferred approach to crop farmers are concerned

The term vegetable historical and historically has been a lot of changes. What is certain vegetable refers to plants that were used with meat. Since there was a man on earth, among the most important food for humans was a vegetable. Hunters and people who were in search of food, herbs from different parts of the vehicle used. Most herbs modern history is related to ancient times. Lots of vegetables such as carrots, parsley, cucumber, lettuce, peas and kohlrabi are among them. In ancient times humans in order to feed the growing of vegetables and medicinal plants, and the first car in the garden and then proceeded to cultivate the fields. Greens today, many years of natural selection, mutation and plant improvement. With specialization in agriculture and created the field of gardening, branches are there in the field that can be vegetable, fruit business, potting, garden and park design, preparation and production of seeds and seedlings, vegetable, fruit, flowers and ornamental shrubs named. The splits in the field

of horticulture mainly due to the different characteristics of growth, different methods of operation and has been cultivated garden plants (joined 2009).

The importance and necessity of the project

Given that our country especially Jiroft and Kahnuj of onion cultivation is prone areas and the use of fertilizer with potassium sulfate compounds and the combination enhances the performance of the product, but research has been done on the impact of these two compounds in onions or has been reported, so be sure that the plan is implemented to the effect of potassium sulphate and zinc sulphate on yield and onion Admiral figure F-1 in weather conditions Jiroft be examined.

Questions

Given that so far the use of potassium sulfate and zinc compounds and their simultaneous impact on onion research has been done, before the project, the following questions should be considered and implemented to meet their desired layout:

1. Is the effect of different concentrations of potassium sulfate plant in quantitative and qualitative improvements have onions?
2. Do not use zinc sulphate on yield and quality and quantity of onion plants will grow?
3.Does the interaction of potassium sulfate and zinc can be effective qualitative and quantitative growth onion plant?

Hypothesis

1. Different concentrations of potassium sulfate may impact on the quality and quantity of onion plants have grown.
2. Sulfate fertilizer on yield and quality and quantity of onion plants will grow.
3. The interaction between potassium and zinc can be effective qualitative and quantitative growth onion plant.

Background research

Madly and colleagues (1390) reported an increase in fixed potassium sulfate with ammonium nitrate increased the diameter of the onion. However, only the first level of ammonium nitrate, potassium sulphate rise to an increase in the diameter of the onion. The effect of ammonium nitrate and potassium sulfate in the possibility of a significant percentage of the leaf area, the interaction effect was significant at 5% level. Application level four ammonium nitrate and potassium sulphate level three (treatment K2N4) accounted for the highest leaves. As can be seen in an increase in the amount of potassium sulfate with ammonium nitrate to level three, leaf area increased and then decreased slightly in the quarter, with an increase in the level of potassium sulphate sulfur compounds play an important role in the growth of plant cells play (Drvks, 2004 and buoys, 2008). Sharma et al (2002) reported that the plant height, diameter, and the onions, along with the amount of sulfur (potassium sulfate) increased.

Optical Hosseini (1391) trial reported that the effect of different treatments on onion bulb yield significant fertilizer, so that the use of fertilizer treatments along with 25 tons of manure per hectare S200 N90P45K100 increase onion yield of 29% (10,800 ha) compared to control. The use of these treatments reduce nitrate levels and increasing the percentage of dry matter in the gland bulbs. Low-nutrient intake of zinc (Zn) increase onion yield, so that the consumption of 25 kg zinc sulfate increased the yield of onion at the rate of 28070 kg per ha gland.

Han (2010) stated that in order to achieve high production and high quality fruit strawberry plants can be sprayed with ZnSo4 before flowering. Abdullahi (2010) stated that foliar application of zinc sulfate before flowering is done to increase the quality and yield of strawberries. In a study (Chatvrvdy et al., 2005), the foliar application of strawberry plants with a solution to significantly increase the weight of nut fruits.

Research findings

Potassium and Zinc.

In this experiment, the effect of potassium on plant height, neck diameter, leaf length, leaf width, weight bulb, the bulb in the bulb diameter and 1% level statistically significant difference, and the effect of zinc sulfate on the parameters p 1% was significant. The interaction between potassium and zinc on plant height, leaf width, bulb weight, bulb diameter and length of the bulb at 1% and the diameter of the neck and the leaves at 5% significant effect (Table 1).

Table 1. Variance analysis evaluated the influence of potassium sulfate and zinc sulfate onions

Table 1. physicochemical properties of farm soil					
ppm	%	Tissue	pH		Property

Zinc	Potassium	Phosphorus	Totall nitrogen	Organic carbon	Sand	Silt	Clay	Lime	Saturated extract			EC (dS.m)	
28	8.29	8.29	0.06	0.62	35	42	23	14.4	49	Loamy	7.8	2.6	Amount

Bush height

Based on analysis of variance effects of zinc and potassium, as well as their interactions on onion plant height was significant at the 1% level (Table 1).

Potassium application of 150 kg per hectare increased growth and plant height with an average of 17.52 inches, it looks at the use of potassium sulfate in addition to plant resistance against environmental stress, maintaining nutritional balance and thus increases plant growth and potassium sulfate in the treatment of plant height in the lowest size with an average of 56.37 cm (Table 3). Most of the onion plant using 30 and 40 kg per hectare 13.48 and 85.47 cm height of zinc were obtained and lowest in the control treatment of zinc with an average height of 81.39 cm (Table 2).

Diameter neck

Analysis of variance showed that the effects of potassium sulphate and zinc sulphate on the diameter of the neck at the level of 1%, significantly influenced onions The characters and their interactions were significant at the 5% level (Table 1). 150 kg of potassium per hectare, increasing the diameter of the onion neck, because the treatments were more onion scales And the average diameter of 40.4 mm diameter neck was lowest in control in the treatment of neck diameter of 3.17 mm (Table 4-2).

Onion neck diameter of 30 and 40 kg of zinc sulfate were not significantly different And both 08.4 and 05.4 mm respectively, with an average statistical group (a) were And the minimum diameter of the neck in control zinc sulfate was 23.3 mm (Table 3)

During leaf

Given that leaves the plant is an important factor in increasing the level of plant canopy, resulting in increased rates of photosynthesis by plants and in this study the effects of potassium sulfate and zinc on length of leaves was significant at the 1% level and the interaction between them, it was significant at 5% (Table 1).

By adding 150 kg of potassium per hectare to bed planting onions, onions plant leaf length was increased to the extent that this treatment increased leaf length of 71.42 cm. And the minimum length of leaf potassium sulfate to control the length of 42.33 cm (Table 2). The use of zinc sulfate 30 and 40 kg ha had no significant difference in leaf length both treatments were compared to the control and in control at the lowest level to 55.31 cm leaf length (Table 3).

150 kg of potassium per hectare, with all dose levels of 20, 30 and 40 kg of zinc sulfate and potassium sulfate is also used in combination with the 30 and 40 kg, 100 kg ha-ha of zinc sulfate increased leaf length compared to other treatments followed And the leaves of the treatments were not significantly different And all in a group (a) were in the order of 4.43, 2.46, 93.44, 06.43 and 6.44 cm grew And in the treatment of sulfate of potassium sulfate with the minimum length of the leaf with an average of 03.36 cm, respectively (Table 4 and Figure 3).

Leaf width

Based on analysis of variance effects of potassium and zinc and their interactions on leaf width at 1% difference was highly significant (Table 1). Onion leaf width with 150 kg of potassium sulfate, compared to other treatments had a significant increase (13.2 cm) and potassium sulfate control showed the lowest leaf width (Table 2). Fed with zinc sulfate 30 and 40 kg per hectare significantly different from each other in leaf width had increased (04.2 and 01.2 cm both Bamyangyn respectively, but significantly increased compared to the other treatments, in control lowest leaf width with an average of 64.1 cm, respectively (Table 3). width leaves treated with sulphate of potassium sulfate 150 kg per hectare to 30 kilograms per hectare compared to other treatments increased significantly (35.2 cm) in control with an average of 45.1 inches was the minimum width of the leaves.

Bulb weight

Analysis of variance showed that the onion bulb weight affects potassium sulphate, zinc sulphate and their interactions were at 1%. With increased consumption of potassium sulfate bulb weight increased, so that the bulb weight 150 kg potassium sulfate treatment compared to other treatments increased significantly (34.149 g) and potassium sulfate in the treatment of used fuel with the lowest weight Average 68.90 gram, respectively (Table 4-2). The use of zinc sulfate were 30 and 40 kg per hectare increase in bulb weight, bulb weight in both treatments with an average of 37.130 and 8.134 respectively hot and the lowest weight control bulb to the 54.112 g (Table 4-3).

Onion bulb weight with 150 kg of potassium sulfate with 30 and 40 kg per hectare consumption of zinc increased significantly compared to the other treatments (respectively 62.162 and 49.154 g) and the lowest weight control bulb with an average of 87.76 grams were obtained (Table 4 and Figure 5).

Diameter hole

Based on analysis of variance effect of potassium sulphate, zinc sulphate and also Mtabl effects on bulb diameter was significant at 1%. Potassium nutrition onion bulb diameter of 150 kg per hectare increased in such a way that the treatment with an average of 42.45 mm bulb diameter greater than other treatments and the control group with an average of 44.34 mm bulb diameter lowest m, respectively.With an average of 67.35 mm were seen (Table 4-3). Using 150 kg of potassium per hectare with 30 kg of zinc per hectare, significantly increasing the diameter of the bulb compared to other treatments, and the average diameter of the bulb was 37.51 mm and 96.31 mm in the control group with the lowest average bulb diameter, respectively.

During bulb

Analysis of variance showed that the effects of potassium and zinc and their interactions on bulb length difference was significant at the 1% level. Potassium increases up to 150 kg per hectare, increasing the bulb had a great impact on the treatment so that the bulb was 86.55 mm and in control with an average of 29.42 mm Potassium least as long as the bulb was . Application of the 30 and 40 kg of zinc sulfate were effective in increasing the bulb and the two treatment groups were not significantly different (respectively 61.51 and 59.51 mm), the control over the bulb with an average of 32 . 42 mm minimum size respectively (Table 4-3). The bulb onions with 150 kg of potassium sulfate with 30 kg of zinc than other treatments (38.60 mm) and at least as long as the bulb with an average of 95.39 mm control was.

Analysis of variance affects yield and onion Potassium and Zinc

Based on analysis of variance potassium sulfate effect on the characteristics of bulb dry matter, shoot fresh weight, shoot dry weight, soluble solid content and yield per hectare was significant at 1%, but as the pH Bulb difference was not significant. The effect of zinc sulfate as the percent dry bulb, wet and dry, the percentage of soluble solids, pH and yield per hectare at 1% difference means influenced, as well as the interactions between Potassium and Zinc on weight wet and dry and yield was significant at 1% and the percentage of dry matter, soluble solid content and pH gland was significant at 5% (Table 8)

Table 2. Comparison interaction of potassium sulfate and zinc sulfate on traits in onions

Potassium × Zinc (in kg ha)	Bulb dry matter content (%)	Shoot fresh weight (g per plant)	Shoot dry weight (g per plant)	Soluble solids (° Brix) (c)	ph	yield (tonnes per hectare)
The K 0 × 0	*73.7*g	*77.295*j	*67.33*f	*13.8*g	*80.5*cd	*00.30750*h
K 0 × 20	*06.8*fg	*91.320*i	*93.35*f	*40.8*fg	*76.5*d	*76.34085*gh
K 0 × 30	*21.8*fg	*93.333*hi	*15.37*f	*13.9*fg	*20.6*abcd	*44.37549*g
K 0 × 40	*33.9*de	*913.355*gh	*28.42*e	*46.9*ef	*36.6*abcd	*00.42708*f
K 50 × the 0	*96.7*fg	*490.341*ghi	*36.36*f	*43.8*fg	*80.5*cd	*08.43906*f
K 50 × 20	*70.8*ef	*863.349*gh	*43.43*e	*36.10*de	*10.6*abcd	*00.45708*ef
K 50 × 30	*18.9*de	*983.425*cd	*61.43*e	*96.11*bc	*50.6*ab	*00.48936*de
K 50 × 40	*27.9*de	*650.406*de	*28.53*cd	*16.11*cd	*86.5*bcd	*16.55832*b
K 100 × the 0	*43.8*efg	*750.*ghi	*06.42*e	*06.9*fg	*90.5*bcd	*00.50520*cd
K 100 × 20	*30.9*de	*940.362*fg	*23.50*d	*96.8*fg	*33.6*abcd	*08.53476*bc
K 100 × 30	*03.10*bcd	*383.465*b	*04.63*b	*33.12*ab	*23.6*abcd	*16.57062*b
K 100 × 40	*78.9*cd	*970.402*de	*36.56*c	*50.11*cd	*56.6*a	*00.55488*b
K 150 × the 0	*73.8*ef	*240.384*ef	*46.49*d	*30.10*de	*96.5*abcd	*00.54900*b
K 150 × 20	*36.10*bc	*00.435*c	*93.63*b	*70.10*d	*86.5*abcd	*00.57204*b
K 150 × 30	*81.11*a	*52.492*a	*12.72*a	*36.13*a	*40.6*abcd	*24.65052*a

Results and Discussion

Given the importance of onion cultivation in the southern region of Kerman and plant nutrition is also important, in this study, results showed that the interaction with sulphate of potassium sulfate 150 kg to 30 kg per hectare, most of the traits the study showed that treatment such as plant height (90.56 cm), weight bulb (62.162 g), shoot dry weight (12.72 mg), TSS (36.13 ° Brix) and yield (kg per hectare 24.65052) was the highest as compared to other treatments and even the application of potassium sulphate 40 kg and 150 kg ha-ha was also at a higher level, low controlSyndahv

and Tivari (1999) suggest that zinc and copper in addition to quantitative parameters increased soluble solids and protein is in the onion.

The results also showed a correlation between the traits that influence potassium and zinc fertilizers can be combined to increase the yield and product quality. The test can be concluded that the effect of sulfur fertilizer potassium and potassium as an element essential to increase plant resistance to disease and drought. It is known that an adequate supply of potassium increases the efficiency of water in the dry matter production plants. When plants be the subject of water, carbon intensity of plants with potassium deficiency is close to zero, while the plants have enough potassium, as well as to continue photosynthesis. The leaves are made of materials which must be transferred to the generator and storage plant, the amount of potassium plant is closer to the optimum, potassium deficiency is faster transfer of these materials reduce the release of carbon and oxygen measuring be.

Improvement of physical, chemical and biological soil using organic fertilizers is required in order to have a sustainable agriculture (Salardyny, 1384). Divine (1374) stated that, since the continuity of organic fertilizer consumption has been associated with indiscriminate use of chemical fertilizers, the soil structure and destruction of ever more drastic reduction in the amount of organic material, thus reducing the C . N ratio and increasing the bulk density of the crop there. One of the most striking effects of reduced growth, loss of leaves (Green Wow and Mons, 1980). Thus, even if the rate of photosynthesis per unit leaf area does not change, the rate of growth due to a decrease in photosynthesis in the plant (which is the result of a decrease in photosynthetic leaf area), decrease (Mons and Pasyvra, 1984). Excessive consumption of phosphate fertilizers, calcareous soils and lack of fertilizers containing micronutrients, including causes of micronutrients in the soil organic Iran (Divine Vthrany, 1378). Zinc deficiency often calcareous soils due to intense absorption Znz + and (OH +) Zn seen in clays and carbonate (Haghparast only, 1371)

Bayburt (1377) reported that consumption of micronutrients, such as spraying onion crop yield increase and with iron and zinc spraying onion extract reduced the acidity and the soluble solid Drsdmvad foliar treatments combined iron and zinc sulfate was obtained.

Hgag et al (1986) reported that application of 180 kg nitrogen per hectare sprayed with zinc sulfate is four per thousand, the highest yield of onion.

Offers

Given that the area south of the province of onion growing areas in the south of the country and by various methods in nutrition onion farmers are exploited,

In order to improve cultivation in the region offered the following suggestions:

1. The above tests in various parts of the southern city of Kerman examined.
2. The use of bio-fertilizers with mineral Mountains macro and micro elements are examined on onions.

.3The use of potassium fertilizers and the cultivation in both the first plan (continued) Second and placed on different cultivars studied.

REFERENCES

Noori Hosseini, M. 1391. Effect of major and minor elements on both the quantity and quality of onion. Soil and Water Research Institute. Final report No. 42148.

Mlavly, d. S.. High-minded, S. c. Tabatabai. 1390. Effect of ammonium nitrate and potassium sulphate concentration of minerals in the onion. College of Horticulture (AGRICULTURAL SCIENCES AND TECHNOLOGY). Volume 25, Number 1 Pages 108-101.

Schwartzkopf, C, 1972. Potassium, calcium, magnesium-how they relate to plant growth. USGA Green Section, pp:1-2.

Mortvedt, G.G.1986; Iron sources and management practices for correcting iron chlorosisproblems. J. Plant Nutr. 9: 691-974.

Haneklaus K, Bloem E and Schung E, 2007. Sulfur interaction in crop. In: MJ Hawkekford and LJ De Kok (eds). Sulfur in Plants. Kpringer, pp. 19.

Abdollahi , m., s.Eshghi and E.Tafazoli. 2010. Tnteraction of paclobutrazol , boron and zinc on vege tative , yield and fruit guality of strawberry (fragaria and ananassa duch. cr . selva) .J.Bial . Environ. Sci. 4(11)67-75.