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Evaluate the Yield of Peanuts under Irrigation and Sulfur Fertilizer

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ABSTRACT: To investigate the effect of different amounts of water and sulfur fertilizer on yield of peanut, Factorial experiment in a randomized complete block design with three replications during the crop year 2013 was conducted in Gilan province in the Astaneh Ashrafiyeh. Treatments was including management of rainfed and irrigated with 50, 75 and 100% water required in the plant and sulfur treatment was with the values 0, 30, 60 and 90 kg/ha. The results showed that the effect of irrigation on yield, and seed pods were significant at five percent. However, the interaction of water and sulfur fertilizer on yield, seed pods and not significant. In irrigation, the maximum yield, and seed pods in 75% of the aqueous, 5376, respectively, 3417.7 and 2348 kg/ha. Effect of irrigation and sulfur fertilizer on seed weight were significant at the five percent level. The amount of lines 50 and 100% of optimum irrigation treatments were similar. The maximum amount of lines in rainfed conditions was with average 74.4g. Among the various levels of sulfur, the maximum amount of 100-seed weight of 90 kg/ha with an average of 75.7g sulfur per hectare fertilizer treatments were observed.

Keywords: Peanut, water requirements, yield, sulfur.

INTRODUCTION

Peanut is planted in arid and semi-arid areas and is very rich in protein and oil quality (Abdzad Gohari *et al*, 2014; Abdzad Gohari, and Noorhosseini Niyaki, 2010). The origin of this plant is an area called Granchaco in Brazil. Drought is one the limiting Factor in the yield of peanut in most of the countries (Abdzad Gohari *et al*, 2014; Abdzad Gohari and Amiri, 2011; Awal and Ikeda, 2002). Peanut crop is short and dark Peas year the warm weather, sunshine and plenty of water and a frost-free growing season of 200 days is needed. Peanuts at temperatures of 15 to 20°C with acceptable speed sprouting, so the first planting date in spring, when the average temperature of the day and night, between 18 and 20°C is considered. When is the best time to harvest peanuts half mild yellowing of the leaves, twigs and leaves occur. Seed is harvested before full maturity will shrink, on the other hand, caused a delay in harvest Pvsdgy seed or soil to sprout again. Among the countries of India, China and Nigeria have the most acreage (Anonymous, 2007). Groundnut cultivation in Iran, Golestan, Khuzestan, Gilan done. Gilan province, it is cultivated mainly in the city ahead of Ashrafieh and river margins Sepeedrud done (Abdzad Gohari, 2012). Limitation of water supplies in different parts of Iran and its decrease in agriculture sector caused water being considered as most important reserve in agriculture (Abdzad Gohari and Babaei Bazkiyaei, 2012). Therefore, when cell growth declines, extent of plant's organs would be limited and it will be shown by stunted leaves and height of the plant and therefore in weight of wet and dry plant (Abdzad Gohari *et al*, 2014; Abdzad Gohari, 2012; Stoyanov, 2005). This can be achieved by using new irrigation methods. Different ways of pressurized irrigation can increase water use efficiency. Drip irrigation is a method that can be used as a new method of irrigating crops. Since drip irrigation, water is continuously available to the plant, only slight changes in the amount of soil moisture in the root zone occurs, Therefore, careful management to ensure water and water stress in plants is prevented from entering. Characteristics that are considered when drip irrigation intervals shorter, longer irrigation or irrigation intensity is low. Sulfur has been an essential element for the growth and development of crops and other micronutrients have been classified. Plant response to sulfur application in a wide range of soils of the world. Sulfur deficiency in rice fields in different countries of the world, such as Indonesia, Brazil, Bangladesh and Thailand have been observed. Groundnut crop production by causing a significant amount of mineral nutrients from the soil to be removed. The observed reaction of peanuts on the fertilizer is very diverse. Providing essential nutrients adequate for achieving high yield in peanuts is required. Therefore, a proper and balanced nutritional program based on sufficient numbers of nitrogen, phosphorus, potassium, sulfur, zinc, calcium and other essential nutrients in agriculture seems peanuts.

MATERIALS AND METHODS

This experiment was conducted in 2013 in the city of Astaneh Ashrafiyeh in Guilan province (37°16' N latitude; 46°56' E longitude; 3 m above the sea level). This area is part of the temperate and humid climate. Meteorological data of the study period, the city ahead of Ashrafieh weather station is received. The amount of rainfall during the growing season was about 80.3 mm. Before land preparation and use of fertilizer, from different parts of the farm land in Amaq 20-0, 40-20-cm to determine the physical and chemical properties of soil samples were taken randomly. The study was made of loam soil. For land preparation, beginning in April 2013 fully tilled land and then in May, the hard soil, ground and post-furrow cultivation was started. cultivated peanut protein in this study NC2 (local varieties of almonds Guil) was selected. Before planting the seeds of the fungicide carboxin Tiraman to about two thousand were disinfected (Abdzad Gohari, 2014). Seeding time, was the first of June in 2013. During practices at farm level, three stages of cultivation to control weeds and soil around the roots was performed. Harvest time was 11 September 2013. After harvesting, the pods for one week in the open air and high humidity conditions, were stored (Abdzad Gohari and Amiri, 2011). In this study, a factorial experiment in a randomized complete block design with three replications was conducted in the field. Each plot has a size of 2.5×6 meters and has 7 rows were planted. Treatment, including management of rainfed and irrigated with 50, 75 and 100% of the required water treatment plant and sulfur with the values 0, 30, 60 and 90 kg/ha. After removal of the parties' two row in each plot, 12 plants were randomly selected. The pods, leaves and stems of the plants were separated and in the oven at 70°C for 48 hours were excluded. After drying, the samples were weighed by one hundredth exact balance. The total weight of the dried pods (with seeds), shoot dry weight and leaf weight, dry weight biomass per gram, respectively. Unit was converted into kilograms per hectare. In order to estimate the yield and pod, then omitting two rows of side-pods and seeds have been harvested from the field and laboratory, weighed by exact balance. To determine the seed weight per plot, 200 gram of dried pods and the pods were removed as samples and 100 randomly selected seed and the exact balance weighing one hundred and was recorded in grams. For variance analysis and the comparison of mean values (Duncan test, probability level of 5%), MSTATC software were used. graph drawing is done with EXCEL software.

RESULTS AND DISCUSSION

A. Biological Yield

The effect of irrigation on yield was significant at 1% level, but levels of irrigation and sulfur fertilizer interaction was not significant (Table 1). Comparison of means showed that the yield of 50% and 75% of aqueous treatments were similar and 100% compared to without irrigation and water requirements of the highest value (Table 2). Songsri *et al*, (2008) research found that full irrigation and irrigation regime, peanut plants studied and concluded that the full value of the yield stress is higher than that of water stress conditions. El-Boraie *et al*, (2009) concluded that peanut yield is reduced under water stress.

Table 1: Variance analysis for effects of irrigation and Sulfur fertilizers on peanut.

		Mean squares			
Source of variation	df	Biological yield	pod yield	Seed yield	100-seed weight
Blocks	2	16320558.3^{*}	14637106.3^{*}	6623741.3^{**}	43.7^{ns}
Irrigation	3	9380392.3^{*}	5076693.7^{*}	2486930.7^{*}	302.7^{*}
Fertilizer	3	3051936.3^{ns}	3755098.1^{ns}	1618265.1^{ns}	263.8^{*}
Interaction	9	4702327.4^{ns}	2114092.5^{ns}	959881.6^{ns}	119.6^{ns}
Error	39	3937881	2373629.7	1083676.2	102.2
CV (%)		4.49	5.80	5.1	4.66

**,*: Significant at 1, 5% level and ns: Not significant

Table 2: Mean comparative on Biological yield, pod yield, Seed yield, 100-seed weight on peanut.

Treatment	Biological yield	pod yield	Seed yield	100-seed weight
No Irrigation	4266ab	2602.6ab	1729.6ab	74.4a
50% of water requirement	5160a	3237.3ab	2207ab	64.8b
75% of water requirement	5376a	3417.7a	2348a	72 ab
100% of water requirement	3449.7b	1988.7b	1354b	64.7b

Means for groups in homogeneous subsets are displayed

B. Pod Yield

Analysis of variance showed that irrigation management on pod yield was significant at the five percent (Table 1). The results showed that the mean pod yield in treatments of 75% compared to without irrigation and crop water requirements 100 percent of the maximum amount of water needed (Table 2). Given the need to water the plant peanuts in the development stage and drought affect plant development and delays the formation of nodes (Abdzad Gohari *et al*, 2014). Water uptake processes is important so that there is adequate soil moisture is necessary for the absorption of nutrients and increase crop yield (Abdzad Gohari *et al*, 2014).

C. Seed Yield

Analysis of variance showed that irrigation management on yield was significant at the five percent (Table 1). Comparison of means showed that the yield of pods per plant water requirement by 75% compared to without irrigation treatments and 100% of the average 3417.7 kg/ha aqueous highest values (Table 2). Establish drought and water restrictions can reduce the development of leaves, followed by reduction of the (Bonari *et al.*, 1992). One major reason for the lack of water in the soil and lower limits of many agricultural products and the plant needs water in shallow rooted annuals, especially those that are more tangible than the trees and the crops that have deep roots are vertical and elongated. Drought led to a sharp decline in yield and magnitude of the reduction depends on the cultivar used (Jogloy *et al.*, 1996). Abdzad Gohari and Amiri, (2011) in a research report that the maximum yield stress can be achieved.

D. 100-Seed weight

Effects of different irrigation regimes and sulfur fertilizer on 100-seed weight were significant at the five percent of their interactions on 100-seed weight was not significant (Table 1). Mean comparisons showed that seed weight at 50 and 100% of optimum irrigation treatments were similar. The maximum amount of lines in rainfed conditions by means of 74.4 g (Table 2). Among the various levels of sulfur, the maximum amount of 100-seed weight of 90 kg.ha with an average of 75.7 g sulfur per hectare fertilizer treatments were observed. In a study Vorasoot *et al.*, (2003) peanut cultivars evaluated and found that the state of stress, the stress is less than the weight Sddanh. Shinde *et al.*, (2010) have shown that stress can be reduced seed weight.

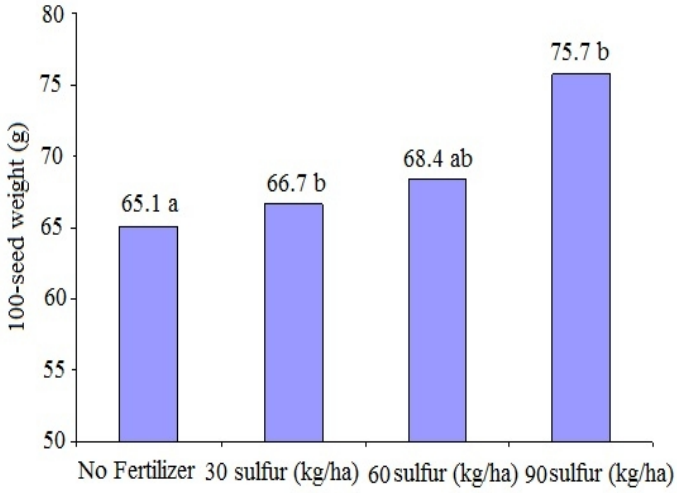

Fig. 1. The effect of different levels of sulfur on 100-seed weight in peanut.

CONCLUSION

The results showed that water restrictions and drought stress reduced leaf development and to reduce the yield of. In irrigation, the maximum yield, and seed pods in 75% of the aqueous, 5376, respectively, 3417.7 and 2348 kg/ha. Among the various levels of sulfur, sulfur content of 60 kg of fertilizer per hectare, with an average seed weight was the most heated 57.7.

The amount of lines 50 and 100% of optimum irrigation treatments were similar, but the maximum amount of lines in rainfed conditions was warm, with average 74.4 g. Among the various levels of sulfur, the maximum amount of 100-seed weight of 90 kg with an average of 75.7 g sulfur per hectare fertilizer treatments were observed.

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