

Peanut (*Arachis hypogaea L.*) response to irrigation different methods in north Iran

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ABSTRACT: The present research was done with the purpose of studying the effect of Irrigation different methods on peanut in the north of Iran. The experiment was doing in randomized complete block design as split-plot arrangement with three replications. Irrigation factor was consisting different methods of drip Irrigation, Surface Irrigation and Sprinkler Irrigation. The results indicate that the effect of different methods of irrigation on dry seed weight and dry stem weight were the level of one percent probability of a significant. But the effect of different methods of irrigation on dry pod weight and dry root weight were the level of five percent probability of a significant. Also, drip irrigation method was the best of irrigation method, with the maximum dry seed weight, dry pod weight, dry stem weight and dry root weight.

Keywords: drip irrigation, surface irrigation, sprinkler irrigation.

INTRODUCTION

Peanut is planted in arid and semi-arid areas and is very rich in protein and oil quality (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 and Amiri, 2011; Awal and Ikeda, 2002). In recent years, due to drought and its yield has declined. El-Boraie ., (2009) concluded that Groundnut yield is reduced under water stress. Supplying nutrients for plants in a normal way is essential to reach an optimum yield in agricultural production (Abdzad Gohari, 2012). Lack of enough water and its irregular scattering during growth stage has caused water requirement is not provided for agricultural plants and they catch into water stress. In this case a proper agricultural management could be useful (Abdzad Gohari, 2012). Cell growth is the most sensitive process influenced by water stress. 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, 2012; Stoyanov.2005). In Iran, this product is grown in Golestan province, Khuzestan province and Guilan province. In Guilan, it is mostly planted in Astaneh Ashrafiyeh and also along Sepidroud river margin. 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). Thus, it is necessary to follow certain measures in determination of plants required water. While water is a very important factor influencing of crop function but using other factors like fertilizer is also effective. Then it is tried that efficiency of utilization of water and other factors being maximum as much as possible and crop function rate being economically acceptable. For achieving this purpose, there must be no problem in respect of man power, amount of capital and energy (Abdzad Gohari, and Babaei Bazkiyaei, 2012). The present research was done with the purpose of studying the effect of Irrigation different methods on peanut in the north of Iran.

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). The rainfall during the growth season is approximately 200 mm. The experiment was established in randomized complete block design as split-plot arrangement with three replications. Irrigation was as main-plot factor consisting of three levels, assessment Different methods of irrigation (Drip Irrigation, Surface Irrigation and Sprinkler Irrigation). To prepare the land, the field was plowed and the soil was by using a disc before the plantation. The plant variety was selected from the local type of (Guil Badam). The seed was given anti-fungal treatment with Carboxintyram with two per thousand ratios (Abdzad Gohari, 2014). Maintenance and harvesting operation were done according to the physiological stages. Weeding was done three times to control the grass growth. After harvesting, the bushes were kept in the open air for one week (Abdzad Gohari, and Amiri, 2011). At the end of the season, dry seed weight, dry pod weight, dry stem weight and dry root weight. The amount of water used during the growth period was provided through irrigation and rains. For variance analysis and the comparison of mean values (Duncan test, probability level of 5%), MSTATC software were used.

RESULTS AND DISCUSSION

Dry Seed weight

The results indicate that the effect of different methods of irrigation on dry seed weight were the level of one percent probability of a significant (Table 1). The maximum seed dry weight was observed in 56.9 grams of drip irrigation, and the minimum dry seed weight was observed in 35.8 gram of Sprinkler irrigation (Table 2). It has been reported that increasing the amount of water used dry seed weight increases (Abdzad Gohari, 2014).

Dry Pod weight

The results indicate that the effect of different methods of irrigation on dry pod weight were the level of 5 percent probability of a significant (Table 1). The maximum dry pod weight was observed in 94.2 grams of drip irrigation, and the minimum dry seed weight was observed in surface irrigation and sprinkler irrigation to sort by 85.6 and 81.6 gram (Table 2).

Table 1. Variance analysis for effects of irrigation different methods on peanut

Source variation	df	Dry Seed weight	Dry Pod weight	Dry Stem weight	Dry Root weight
Blocks	2	70.34 ^{ns}	491.49 ^{ns}	54.66 ^{ns}	2.73 ^{ns}
Irrigation methods	2	669.35**	274.87*	4866.59**	1.84*
Error	10	36.46	142.44	183.56	2.73
CV (%)		12.9	13.6	16.4	13.6

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

Table 2. Mean comparative of dry seed weight, dry pod weight, dry Stem weight and Dry Root weight in irrigation different methods on peanut

Irrigation different methods	Dry Seed weight	Dry Pod weight	Dry Stem weight	Dry Root weight
Drip Irrigation	56.9 a	94.2 a	88.8 b	12.2 a
Surface Irrigation	46.8 b	85.6 b	107.1 a	12.6 a
Sprinkler Irrigation	35.8 c	81.6 b	51.2 c	11.7 b

Dry Stem weight

The results indicate that the effect of different methods of irrigation on dry stem weight were the level of one percent probability of a significant (Table 1). The maximum dry stem weight was observed in 107.1 gram of surface irrigation, and the minimum dry stem weight was observed in 51.2 gram of sprinkler irrigation (Table 2).

Dry Root weight

The results indicate that the effect of different methods of irrigation on dry root weight were the level of 5 percent probability of a significant (Table 1). The maximum dry stem weight was observed in drip Irrigation and surface irrigation to sort by 12.2 and 12.6 gram (Table 2). Abdzad Gohari, (2014) concluded that soil moisture in the upper layers of the roots can absorb water and get wet and humid sub-layers remain relatively intact parts of the surface density of roots are more.

CONCLUSION

The results of this investigation showed that with respect to irrigation different methods, the maximum dry seed weight, dry pod weight, dry stem weight and dry root weight was in drip Irrigation method. The maximum seed dry weight was observed in 56.9 grams of drip irrigation. The maximum dry pod weight was observed in 94.2 grams of drip irrigation, and the maximum dry stem weight was observed in 107.1 gram of surface irrigation.

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