The investigation of the influence of seed and weeds management on the performance and performance components of mungbean in Khoramabad

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Abstract: Grain legumes are the most important protein resources in arid and semi-arid regions in the world and had important role in the economy of these regions (Tasfi etal.2006), mungbean was belonging to phaseolae, groupphaseolinae, the family of fabiacea and one of the important members of vigna. Vigna radiate is a fine grained legume, summer and short day that is cultivated as non-irrigated in central and south east centers of Asia (Dikasta et al., 1999). As Iran is located in arid and semi-arid regions and the shortage of water in these regions, there is the probability of dryness tension in all plants growth stages. The cultivation of plants with short growth as Vigna radiate can be useful in these regions. Vigna radiate due to the ability to fix nitrogen, short growth time and high performance potential is one of the most common plants that is used in cultivation systems of grains (Parsa and Baqeri, 2008). Vigna radiate is one of the valuable grains full of phosphor. Mungbeanis rich with protein and it has about 25% protein that is used as complete, divided or flour. Compared to new species (various kinds of beans) is digestible and delicious. Green sprouts of mungbean are full of vitamin C, riboflavin and thiamin and is used in providing most of the salads and foods. Cultivation of mungbean as green fertilizer is common and is legume has azoth fixation ability, it is useful in avoiding the soil erosion. Due to short growth period, it is useful for cultivation alternatives in compressive cultivations. In Iran, due to short growth period, mungbean is cultivated after harvesting wheat or barley. By applying cultivation managements we can change the morphological attributes of the plant. If these changes are related to the effective attributes on the performance and its optimization, the performance is increased. Determining the best cultivation density is of great importance in planning to achieve high performance and good quality. One of eh factors affecting the vegetation and attraction of sun is plant density. The distribution and density of the bushes affect the attraction of effective factors on the growth and inside and outside completion of the bush and it is one of the determining factors of seed performance. On the other hand, the competition of weeds is one of the factors reducing the production of cultivation plants. The increase of the cultivation density reduces the adverse effects of the completion of weeds. There is no information about the effect of cultivation density and the competition of weeds on the performance and performance components of mungbean in Khoram Abad condition. Thus, the current study is done to achieve these data and determining the best cultivation density in weeding and interference of weeds in climatic conditions of Khoramabad.
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1. Introduction

Sink et al. (1991) performed a study with three amounts of mungbean seed and with four levels of row distance in a clay loam soil and observed that the seed performance in the row distance of 30cm compared with distances 20, 25cm and manual spraying was higher. In the cultivation with the distance of 30cm, the number of covers in the bush, the number of seeds in the cover and the weight of 1000 seeds were significantly high and then in the distance of 25cm. The performance of the seed per hectare was increased continuously with the increase of the amount of seed. The reduction of the performance of cultivation plants due to the presence of weeds dependent upon the region and species of its specific weeds (Ikarda, 1987).

The change of vegetation density affects the growth of weeds. The increase of density increases the competition ability of the cultivation plant and is introduced as a tool in combinational management of weeds (Harris and White, 2007). By applying cultivation managements we can change the morphological attributes of the plant. If these changes is for effective attributes on the performance and its optimization, the performance is increased (Rezvani Moqadam, Rahimian Mashhadi,2000). Determining the best cultivation density is of great importance in planning to achieve high performance and good quality. The distribution method and density of the bushes affected the productivity of effective environmental factors on the growth and competition of inside and outside the bush, and is the important factor of seed performance (Boward and Harovil, 1996). In the studies of Shokla and Diksit (2000) in mungbean, the reduction of the distance between the bushes increased

the growth speed of the product in growing period, more absorption of light in growth season and the performance of the grain.

The increase of the competition of mungbean with weeds and the increase of the number of stems in the bush due to the reduction of the distance between the cultivation bushes of mungbean is shown. But the distance between the cultivation bushes distance didn't influence the number of covers and growing stages.

In high density of the reduction of the distance between the bushes, due to strong completion for light and the shortage of environmental factors, increased the speed of the falling of the leaves. These can reduce the good effects of initial rapid growth (Boward and Harvil, 1996) and in case of strong limitation in environmental factors reduced the performance of grain (Sanda et al, 1977). The efficiency of light consumption is an effective solution for quantity of the congestion of dry matter and is calculated as linear regression gradient of biomass against attracted congestion ray (Akmal and Janson, 2004).

Cultivation arrangement in the farm is one of the important activities of cultivation and has important role in light distribution in vegetation (Sarmadnia and Kuchaki, 1993) with inside plant competition. The change of cultivation model via reduction or increasing the distance between and on the rows led into the reduction or increase of bush density in the surface. Various studies showed that the increase of vegetation density and determining the good density of mungbean in each region can not alone guide the production to the maximum amount and cultivation arrangement is of great importance. Determining good cultivation model in mungbean, the improvement of the efficiency of light absorption by the plant and uniform consumption of the inputs are the results (Najafi et al. 1996). Based on the mutual effect of cultivation density, cultivation model and environmental conditions, the investigation of the various models and densities of mungbean in each of the regions of cultivating this plant is necessary to achieve the maximum performance. By applying cultivation managements we can change the morphological attributes of the plant. If the changes are related to the effective attributes on the performance in its optimization and its performance is increased (Rezvani Moqadam and Rahimian Mashhadi, 2000).

2. Materials and methods

The test of the effect of cultivation density on interference of mungbean and weeds as factorial in completely random blocks with 8 treatments and 3 replications in Sarab Changayi of Khoram Abad was done. Test factors were including: a. the amount of mungbean seed in four levels (25, 50, 75, 100 kg per hectare), b. controlling weeds in two levels (weeding and non-weeding).

The operation of providing the cultivation bed was including Moldboard Plow disking for crushing the stones and land leveling by trowel. After preparing the land, the cultivation was manual spraying. In non-weed plots, there was no control against weeds.

Sampling method and note taking

In non-weed plots, the density and production of biomass of weeds in flowering time of cultivation plant after elimination of margin(50cm on each side), four angles sampling unit (quadrate) with the dimension of 50*50 cm were thrown three times randomly and after the identification, the weeds bottom was eliminated and was put in the oven for 48 hours at the temperature of 75 , dry and weighted. The counting of the number of cultivation plant bush at level 3 frame 0.5 in 1 m in each plot was tested and the measurement of the performance and performance components of mungbean at the end of growth season in all the plots was done after deleting the marginal effects of harvest and to determine the dry matter of mungbean per surface for 48 hours at the temperature of 75 inside the oven.

Data analysis methods

In this test, the evaluated attributes were consisting of the performance and performance components with some of morphological attributes of mungbean. The analysis of final data of the test was done by variance analysis by EXCEL and MSTSTC software. The comparison of the averages of the data was calculated by Duncan test at 5%.

3. Conclusion and discussion

Cultivation mungbean plant

Biological performance, grain performance, mungbean harvesting index were not significantly affected by the amount of seed (Table 1).

Consisting with the increase of seed, the mentioned three attributes showed decreasing trend as by the increase of seed from 25 to 100 kg per hectare, biological performance, seed performance and harvest index were 28.55%, 31.25%, 1.04% were reduced (Table 3). This issue showed the amount of seed of 25kg per hectare to achieve the potential of mungbean seed performance and the lack of necessity of applying more seeds. In other words, there is no need to take costs of seed more than this limit.

Based on the results of variance analysis, the control of weeds significantly affected the performance of mungbean, but the harvest index was not significant (Table 1). The weeding increased 79.83%, 82.68% and 8.37% of biological performance, grain performance and mungbean harvest index (Tables 3). This issue showed the importance of interference of weeds in reducing the performance of mungbean and the necessity of controlling weeds to achieve high performance.

Table 1: The results of variance analysis of biological performance data, grain performance, mungbean harvest index

Changes resource	Biological perforamnce kg/h	Grain performance kg/h	Harvest index
Squares average			
Seed	n.s 606899.778	n.s 338220.167	n.s 23.532
Weed management	** 7020016.667	** 3445868.167	n.s 10.270
Mutual effect of seed and management of weed	n.s 44397.556	n.s 14717.500	n.s 8.558
Main plot test error	246501.167	115073.810	13.932
Changes coefficient	26.19	26.19	5.49

*significant at 5%, ** significant at 1 and n. s non-significant

The mutual effect of seed and control of weeds for biological performance attributes, grain performance and mungbean harvesting index was not significant statistically (Table 1). The similar answers of the mentioned attributes to the changes of seed in control and the lack of con troll of weeds are the reasons of this issue. The maximum average of biological performance to treat control of weeds as 25kg per hectare (2862 kg per hectare) and the minimum amount was obtained for the treatment of interference of weeds with seed amount 100kg per hectare (988.7 kg per hectare). The maximum grain performance (2011 kg per hectare) for treatment of controlling weeds with 25kg per hectare and least average of grain performance (672.7 kg per hectare) for the treatment of interference of weeds with seed 100kg per hectare was achieved.

Table 2: The results of variance analysis of the data of the number of covers per m2, the number of covers in bush and the number of grains in cover of mungbean bush

Changes resource	The number of cover per m2	The number of cover in bush	The number of grains in cover
Squares average			
Seed	n.s 35841.375	n.s 21.137	n.s 7.202
Weed management	**5541192.042	**109.227	* 10.270
Mutual effect of seed and management of weed	n.s 8597.153	n.s 10.819	n.s 2.548
Main plot test error	17074.054	2.925	1.197
Changes coefficient	21.86	27.22	12.27

*significant at 5%, ** significant at 1 and n. s non-significant

Table 3: The simple effect of seed factors and the management of weeds on biological performance, grain performance, harvest index and the number of grains in the cover of bush of mungbean

Factor	Level	Biological performance kg/h	Grain performance kg/h	Harvest index	The number of grains in cover
Seed	25 kg per hectare	a2273	a 1600	a 70.65	a 10.43 b 8.567 b 7.833 b 8.850
	50 kg per hectare	2045 ab	ab 1395	ab 67.62	
	75 kg per hectare	1641b	1087b	b 65.87	
	100 kg per hectare	1624b	b 1100	ab 67.78	
Weeds management	Weed interference	1355b	916.5b	a 63.3	b 8.3 9.6a
	Weed control	a 2436	a 1674.3	a 68.6	

The test of averages comparison showed the increase of 9.88 percent of mungbean harvest in the treatment of seed in 25kg per hectare in weeds management to 75kg per hectare seed and in interference weed conditions (Table 4).

The treatments with similar alphabets in each column based on LSD test at 5% didn't have significant difference.

Table 4: The mutual effect of the factors of seed and weeds management on biological performance, grain performance and harvest of mungbean

Factor		Biological performance kg/h	Grain performance kg/h	Harvest index
25 kg per hectare	Weed interference	1684bcd	1188bcd	a 70. 5
50 kg per hectare	Weed control	a2862	A2011	a70.8
75 kg per hectare	Weed interference Weed control Weed interference Weed control	Cb1555 b2536 b1193 2090abc 988.7D	Cd1039 ab1751 d766.7 bc1407 d672.7	a65.8 a69.43 a64.43 a67.30 a68.57
100 kg per hectare		2259abc	abc1527	a67.00

The treatments with similar alphabets in each column based on LSD test at 5% didn't have significant difference.

The number of grains in the cover affected by seed was significant (Table 2). The maximum numbers of grains in bush cover mungbean (10.43 grains in cover) was related to the 25kg per hectare seed and its minimum amount to 75-kg per hectare seed (7.83 grains in cover) (Table 3).

The effect of weed management on the number of grains in cover of mungbean

Was significant at 5% (Table 2). Weeding caused the increase of mungbean

On the number of grains in the cover as the interference of weeds and their competition with mungbean

Reduced 13.54 % the number of mungbean

To the control of weeds (Table 3).

Weeds

In this study, there were 12 types of weeds as kharfeh, Taj khorus, Oyarsalam, Salmetareh, Pichak, shirin bayan, Toq, panjemorqi, Kanaf Vahshi, Azmak, Ferfion, sun flower in mungbean farm.

The effect of seed on dry weight of weeds was not significant (Table 5). The average of dry weight of weeds for the treatment of seed 100kg per hectare mungbean (75.6 g per m2) and the maximum average was related to 50kg per hectare seed (17.4 g per m2) (Table 6). Harris and White (2007) reported that the change of vegetation density can affect the growth of weeds as increasing the density increases the competition ability of cultivation plant and is introduced as a tool in combinational management of weeds.

Table 5: The results of variance analysis of dry weight data and density of weeds in mungbean

Changes resource	Dry weight of weeds	The density of weeds	
Squares average			
Replication	0.033	2.92	
seed management	0.024ns	8.99ns	
	0.366	6.069	
Main plot test error			
Changes coefficient	11.47	31.93	

*significant at 5%, ** significant at 1 and n.s non-significant

Data logarithm change, 2 data square change

The density of weeds was not influenced by the amount of seed and there was no significant difference between various values of mungbean seed in terms of density of weeds (Table 5), but the test of averages comparison showed the reduction of 61.5% of the density of weeds in the amount of mungbean seed 100 kg per hectare to the 50 kg per hectare seed and this reduction of density of weeds in 100 kg per hectare seed was to 25 kg per hectare mungbean as 58.4 (Table 6).

The treatments with similar alphabets in each column based on LSD test at 5% didn't have significant difference.

It seems that in low densities of mungbean, frequency of environmental resources including light, food and humidity caused that the weeds grow more but in high density due to the high population of vegetable had low growth opportunity for weeds. In other words, this result showed the thinness of weeds of the competition with cultivation plant (Silverton, 1982).

Table 6: The simple effect of the factors of seed amount on dry weight and density of weeds in cultivation of mungbean

Factor	Level	Dry weight of weed	Weeds density
Seed amount	25 kg per hectare	154.8 a	59.33ab
	50 kg per hectare	1744.5a	64b
	75 kg per hectare	90.53a	38.67ab
	100 kg per hectare	75.60a	24.67a

Conclusion

Based on the results of this study, its seems that the seed of 25kg per hectare to achieve the potential of mungbean seed performance for food consumption and biological performance as animal food was better than other cultivation density. As in the treatment of 25kg mungbean seed per hectare, the density of mungbean bush was low and based on the completion of weeds in these conditions and growth of weeds is increased due to the frequency of environmental resources as humidity and food, management of weeds by weeding not only increased the performance of mungbean, avoided environmental damages and helped the stability of environment resources.

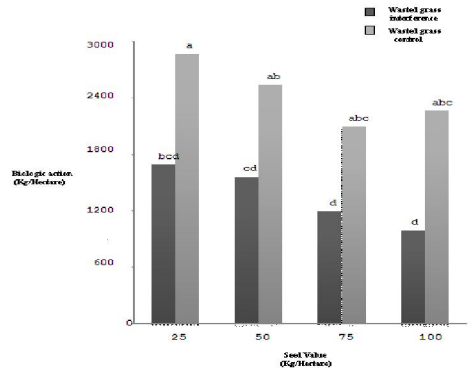

Fig. 1: The mutual effect of mungbean seed and weeds management on the biologic performance of mungbean plant

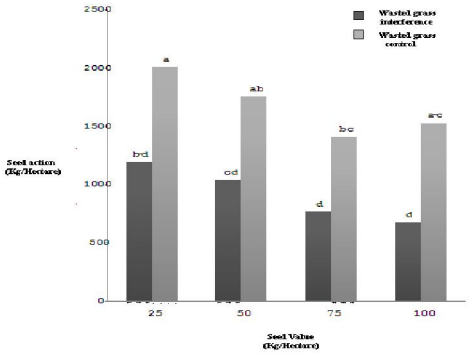

Fig. 2: The mutual effect of mungbean seed and weeds management on the biologic performance of mungbean plant

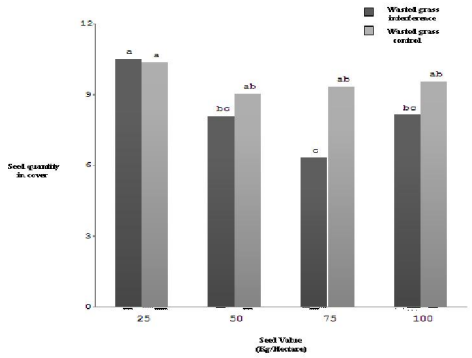

Fig. 3: The mutual effect of mungbean seed and weeds management on the number of grains in cover of mungbean plant

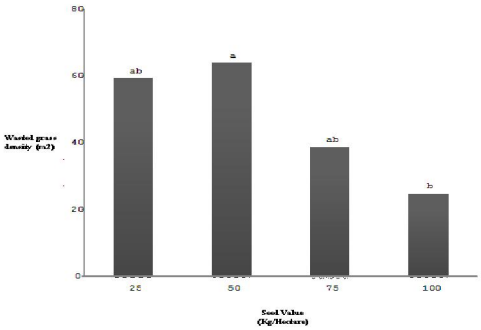

Fig. 4: The effect of mungbean seed on the density of weeds per m^2

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