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Effects of Moist and Dry Condition Planting method on weed numbers and Wheat Yield in North of Khuzestan

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ABSTRACT

To examine new seeding methods included raised bed planting two different grain drills were designed. Also, to compare their effects on seedling emergence and finally wheat grain yield, an experiment was conducted using completely randomized block design with three replications in north of Khuzestan in 2013. Moldboard plows with 25 cm depth followed by twice 10 cm depth disc harrows. Two methods of planting included moist and dry soil seeding by using grain drill equipped with fixed and spring loaded furrow openers were compared. The effects of space between the seeding rows and also beds of 60 and 75 cm were evaluated. The amount of 165 kg/ha wheat (Triticum aestivum L(was sown at 40 mm depth for all treatments. Analysis of the resulted data showed that moist planting using spring loaded furrow openers and raised bed by 75 cm distance between planting beds produced significantly)P≥1% (higher grain yield and increased yield to 33% greater than flat planting. More weed numbers was proper on dry condition for average 48/417 bush/m2. Least weed numbers on moist condition for average 19/875 bush/m2. The see between for weeds on raised bed and surface Chenopodium murale is more and Raphanus raphanistrum was Least. More grain yield was produced under moist (5467 kg/ha) compared to dry (4133 kg/ha) seeding conditions. Finally, the highest harvest index and grain yield were measured by using the 75 cm bed space.

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INTRODUCTION

In recent years the use of cultivation techniques In order to properly prepared seed bed And the seeds are planted at a depth of approximately uniform More than ever necessary Most usable machines planting in Iran Seed parallel lines in the bottom plots are putting for flood irrigation The result of this combination of planting and irrigation The decrease in the percentage of Green and bud number per unit area will be Wang *et al*, [4] In experiments on two wheat varieties cultivated in China, the performance of both the stack and the customary review and cultivation had twenty percent increased performance On the stack and reduce 28 percent weeds Rahdar and Asoodar *et al*, [1] planting in two ways linearly Create furrows and stack in the distance 60 and 75 cm Also create a stack After that planting at intervals 60 and 75 cm and 3 or 4 lines cultivation were examined on the stack Use Furrower with the distances 75cm and after that cultivation in whole of land (in a water and stack)had a Best treatment plant The level of performance with respect to reducing the number of weeds Reduces the amount nine percent Therefore, Considering that the seeding machines Wheat planting was done mostly flat And flood irrigation is done And work towards saving seeds And fertilizer With the aim of reducing costs and reducing the number of weeds [2].

The weeds at the stage before planting And can control the preparation stage this study for evaluation two planting systems on the stack and also The effect of stack size and the number of cultivation lines on each stack Compared with conventional planting and number of weeds and function of wheat in Climatic condition in Khuzestan province has done And pursues the following objectives.

- *survey of planting seeds in both cultivated systems moist sowing a dry sowing for controlling and reduce the number of weeds:*
- *Choose the most suitable cultivation system that will produce the highest yield:*

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Advances in Environmental Biology, 8(11) Special 2014, Pages: 290-293

MATERIALS AND METHODS

The experiment was conducted at Shuoshtar region (49º 14′ E and 23º 2′ N), 90 Km north of Ahvaz, at an average altitude of 670 m. The experiment field (pervious planting) in a 2 year alternative rotation was wheat, and wheat in order be in 2012-2013 was under wheat planting as well. The soil texture was silt and loom for the depth of 0 – 30 cm had possessed silt and loom texture with the electric conductivity (EC) 2/3 and PH 6.98.

The experimental design was performed in statistical split plot under randomized blocks design with 3 replications. Two levels of soil moisture known as moisten and dry condition selected as the main plots and three planting rows on the beds with the bed distance of 60 and 75 cm with fixed and spring loaded furrow openers as sub plots were the experimental design pattern. This experimental field divided into 27 plots and wheat planting pattern was sown in expected designed levels as follows [3].

Testimonial:

conventional tillage (using leveler and disk) and assuming the fertilizer input according to soil, flood irrigation as conventional which most farmers used.

Dry condition:

using primary tillage and leveling was similar to previous. Furrowers were shaped at the same time as seed planting. The amount of assuming 165 kg/ha of seed using both 60 and 75 cm row space with 3 planting lines on each raised bed.

Moisten condition:

By means of using furrowers in the field to shape the beds and irrigation was followed before seeding for making a seed bed with enough moisture to be used for crop to emergence without any more irrigation. At the time that soil moisture content was reached at the 14-18% it was ready for seeding the wheat (Attila) seeds into the moisten soil. In both ways the date of planting was done according to the advice of research department at the ministry Jihad Keshavarzi.

Seedling emergence:

The number of grown plants in one meter and on two planting lines (the middle row and one row beside it) was counted and inscription by using of the equation (1) to calculate the seedling emergence percentage (6).

$$E = \frac{n_1}{n_2 \times v \times p} \times 100 \quad (1)$$

n_1: the number of grown seeds
n_2: the number of planted seeds
v: the percentage of germination
p: the percentage of purity

Speed of emergence:

The number of plants in 1 meter along the rows with the days after planting is according to the following equation (2).

$$V = \frac{N_1 + N_2 + N_3 + ... N_n}{N_1 T_1 + N_2 T_2 + N_3 T_3 + ... + N_n T_n} \times 100 \quad (2)$$

Where: V is the coefficient of velocity of seedling emergence, N_1, N_2 …, Nn is the number of newly emerged seedling and T_1 …. T_n is the number of days after sowing when the seedling were emerged.

Grain harvesting and yield components:

After the harvesting was completed, the main parts of yield as the number of heads per one m^2, the number of seeds in head, the weight of one hundred seeds, and finally grain yield were measured. For achieving of measuring data according to the method of sampling and harvesting, first $1m^2$ in 4 randomly replications was harvest by hand, then harvested biomass from the surface of the field was gathered for weight recording. Also the number head in each m^2 was counted, Heads of 20 plants were separated randomly and their seeds were counted, then their average in 20 heads as the number of seed per head, the weight of seed with random samples was counted by three repetitions for each treatment.

For controlling weeds On the ground with the use of herbicides Cludinafop proparjil with 8 percent (Tapic) Amounted to 750 mm liters per hectare against narrow-leaf weeds of herbicides three metil benorun (Granstar) The rate of 25 grams per hectare against broadleaf weeds and Tiller stage of wheat were used Removing weeds

Advances in Environmental Biology, 8(11) Special 2014, Pages: 290-293

between the rows with cultivators To determine function and yield components in an area of 4 square meters per piece of land were harvested by hand. The total weight of the seed, the spikes were removed and weighed.

RESULTS AND DISCUSSION

Weed:

In Tables 1, 2, 3 number and Species identification of weeds the piece of land for test in any cultivation has been recognized among the weeds observed on the stack Nettle leaves and Wild Radish Respectively has allocated highest and lowest weeds

Table 1: Characteristics and the mean number of weeds per square meter in moist sowing

BROADLEAF	Number	Narrow-leaf	Number
Chenopodium murale	9	Lolium spp	2
Malva nicaeeusis	2	Avena ludoviciana	3
Beta maritima	1		
Raphanus raphanistrum	1		
Sinapis arvensis	2		

Table 2: Characteristics and the mean number of weeds per square meter in dry sowing

BROADLEAF	Number	Narrow-leaf	Number
Chenopodium murale	20	Lolium spp	14
Malva nicaeeusis	3	Avena ludoviciana	12
Beta maritima	2		
Raphanus raphanistrum	3		
Sinapis arvensis	4		

Table 3: Characteristics and the mean number of weeds per square meter in Conventional cultivation of piece of land

BROADLEAF	Number	Narrow-leaf	Number
Chenopodium murale	20	Lolium spp	14
Malva nicaeeusis	3	Avena ludoviciana	12
Beta maritima	2		
Raphanus raphanistrum	3		
Sinapis arvensis	4		

Table 4: Variance analysis of weeds per unit area

S.O.V	Df	Seedling emergence	Speed of emergence	Head /m^2	Grain /head	1000 Seed weight	Biological Yield	Grain yield	HI
Sowing method	8	193/29**	0/091**	6539/26**	171/65**	34/07**	4/399**	0/47**	34/39**
Replication	2	31/33	0/00001	51/815	16/41	5/64	0/22	0/25	1/34
Experimental error	16	68/92	0/003	311/704	13/07	2/69	0/11	0/01	0/77

The variance of the number of weeds in different treatments under study are presented in Table 4 The results showed that the number of weeds in treated cultivation was significant at the 5% level was observed highest number of weeds in dry sowing and lowest number of weeds is related to moist sowing The result of this due to mechanical fight With weeds before planting. Average comparison number of treated weeds shows cultivation type Irrigation land before planting some of the seeds get green Using a weeding immediately took them away the result is clear in Figure 1. highest number of weeds in dry sowing with average 48/417 Plants per square meter fighting before Cultivation was not performed to eliminate them lowest number of weeds related to moist sowing With an average of 19/875 plants per square meter Before planting them destroyed Results with the results of sing et al and Zarif Neshat [5] matched The Effect of cultivation on the average number of weed.

Yield and yield component:

Analysis of variance of spike per square meter are presented in Table 5 The effect of cultivation distance between rows and type of opener track on mean number of spikes is significant at the 1% level. As Figure 4 shows a Treatment ,moist sowing due to wet soil Early in the course planting The percentage of green speed Early seeds had a significant effect In this treatment, the number of spikes per square meter Ratio dry sowing has increased This increase can be related to the interaction of the total cultivated land in the same wet start planting And the distance between of 75 cm know Number of spikes per square meter the trend of change shows The reduction in density The distance between rows of 75 cm number of spikes increases The largest number of spikes per square meter, with an average of 458 relates to spikes is common cultivation The most number of spike related to moist sowing The distance between rows of 75 cm And using linear with furrow opener springer Due to soil moisture at the beginning of cultivation and increasing the distance between crop rows From 60 cm to 75 cm and optimal performance with furrow opener springer in the moist sowing cultivation The same depth

Advances in Environmental Biology, 8(11) Special 2014, Pages: 290-293

of seed putting and uniform growing percentage rate increase at the beginning The increasing number of spikes per square meter has a positive effect The lowest number of spikes per square meter, with an average of 311 relates to dry sowing cultivation The distance between the rows of 60 cm And using linear furrow opener fixed.

Yield and its comparison with conventional planting:

Figure (1) shows the average of grain yield for different treatments, the most yield of production was achieved (5467 kg/ha) where the moisten condition at sowing was applied. The space between rows was shown different effects on grain yield and 75 cm rows produced greater yield with comparison to 60 cm row space and then flat seeding respectively. Afzalinia *et al* [2] reported similar results where bed planting was compared with flat seeding. So, the significantly (P≥1%) least amount of grain yield (4133 kg/ha) was measured where the conventional planting was applied. Flood irrigation was one of the worse effect on grain yield production. John Heard and Rehm shown the similar results comparing bed planting versus flat irrigation on wheat grain yield.

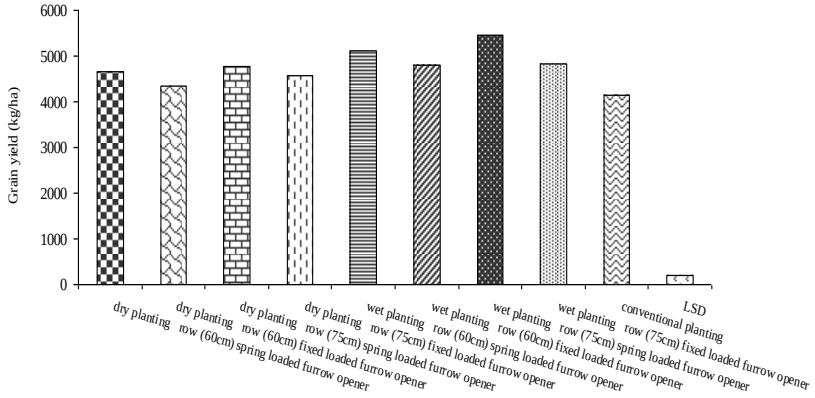

Fig. 1: grain yield produced using different planting type, furrow space and opener types

Conclusion:

Raised bed planting and the space between rows could change the wheat seedling percentage and the speed of emergence of the seeds from the beginning of planting measurements. According to the calculating results of raised bed planting on seed numbers per head, heads per m2 were greater (P≥1%) than other treatment. Also The see between for weeds on raised bed and surface Chenopodium murale is more and Raphanus raphanistrum was Least. More grain yield was produced under moist (5467 kg/ha) compared to dry (4133 kg/ha) seeding conditions. Finally, The highest harvest index and grain yield were measured by using the 75 cm bed space.

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