



RESEARCH ARTICLE

EFFECT OF TILLAGE METHODS ON THE TYPES OF TECHNICAL INDICATORS IN RESIDUAL RICE AND WHEAT IN THE PROVINCE KHOUZESTAN

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ABSTRACT

Considering the existence of rice and wheat rotation on 50 thousand hectares of Khuzestan province and the necessity of efficient use of soil, crop year study period (2009-2010) in the city were examined Shoushtar. This research project as chopped blocks in a randomized complete block with three replications was carried out. The first factor in this plan tillage methods that include: T1) moldboard plow disk light (TOF region), T2) disc-style chisel plow, T3) heavy disk Rotator and T4) in two perpendicular heavy disk load time. The second factor consists of rice, including high yielding varieties (LD183) and local varieties (Champa), respectively. Results indicated that tillage method and type of significant effect on the number of green plants per square meter, but no tillage methods significant effect on the capacity of a farm is effective. Also, tillage methods on the number and type of soil bulk density, aggregate mean weight diameter, the translation of the soil, grain yield and harvest index had a significant effect. Finally, treatment 4 (two discs of heavy vertical time) with the performance of 5,140 kg per hectare, appropriate size hunk of dirt, with return to 50 percent soil and time is better than other treatments.

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INTRODUCTION

The need of human to foods and particularly corps is very vital. Paying attention to the point that Khuzestan state has potential to farm twice a year; also wheat and rice farming in fall and summer, respectively, farming the corps has been important. Wheat and rice are farmed together through 50hectars all over Khuzestan state. It is important to know farming rice is doing watery kind so soil accomplishment would be happened in a 0-15 cm layer that wheat root is there. Understanding the limited time of land preparing due to rice harvesting with wheat farming, it is impossible to farm in an appointed time with tillage operation completely. Also increasing optimizing and soil humidity converting to prevent soil structure destruction should be considered. Rice remain in the land is burnt and this causes to die microorganisms and serious injuries to the land. Covering this remaining materials using tillage methods has benefits moreover decreasing operation time (9). In a test in Ghamloo station in Kurdistan state on the effects of covering soil with weeds it was resulted that under soil and fraction timour has the highest permeability of 18.57 cm in 110 min and under soil timour with 15.95 in

110 min while burning remaining timour with 7.03 cm in 110 min has the lowest permeability (4). Tillage operation affect on the main properties of soil such as: temperature, storing and scattering humidity in soil (12). Therefore to consider the influence of tillage methods study in relevant of some properties of soil, growth and product of soil done.

MATERIALS AND METHODS

This research was done in Main Ab zone of Shushtar city with an arid-semi arid weather. At first for recognizing physical properties and finding suitable conditions to performing tillage, soil tissue was considered. It was clay-silt. Statistical samples included fractured cert in blocked fames with 3 times reputations. The main cert includes tillage methods as the below:

- T1: light disk
- T2: light disk
- T3: heavy disk+ rotator
- T4: twice heavy perpendicular disks

To do this research, after doing the plan, two kinds of rice were farmed from Jun. 2009. All of farming operations were done in rice farming adapting to common one in the zone. After rice harvesting in middle of Nov. 2009, the operation was done in a land with 2925 square meters in terms of difference between kinds of remaining and tillage methods; so

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the test cert were divided in 10*20 meters and four cert in a length route. At first, the land was divided to six parts while using the plan map, locations of two kinds of rice were appointed. After rice harvesting width bands including remaining of two kinds were fixed and four methods of tillage were done. To start the operations, first the machines of tillage were brought to the land, and width, length and depth settings were presented, then the depth of machines penetration was set. The land preparing was finished in 30/12/2009 that sampling of soil was done. Thus fertilizer formulating with NPK (Urah – Phosphate – Potas) was used. The final and pre final passes were not done because of raining and suitable humidity. Chemical poisons were not used why weeds suitably and little growth of them in rice farming. After consideration of wheat, necessary samples were collected for recognizing the index properties and seed operation per square meter in the land. Also sampling was done in 30/5/2010 and harvesting the land surface was done by Jandir combine 955.

RESULTS

1- Apparent special mass of soil

This mass is calculated by:

$$\rho = \frac{M}{V} \times 100 \tag{1}$$

Where , M and V are density, mass and volume, respectively.

2- Average of weight diameter of grain soil

To measure the average of weight diameter of grain soil, we used lab separators. The number of the separators was 5 and were set on each other in terms of penetration holes of them. After doing each timour in every cert, some points were selected and samples of soil lifted were set by standard separators. The property of size of grain soils is calculated by:

$$MWD = \sum_{i=1}^n \frac{W_i}{W} \times D_i \tag{2}$$

Where MWD, W, Wi, and Di are average of weight diameter of grain soils, weight of total fractured soil in each sample (kg), weight of defracted soil in the case separators and average diameter of the case grid (mm), respectively. Also average of weight diameter of grain soils could be calculated by:

$$MWD = \sum \frac{1}{W} \times (5A + 15B + 25C + \dots + NH)$$

Where MWD, W, (A, B,...) and N are average of weight diameter of grain soils, total weight of sample, weights of sample soil passed from separators and average diameter of grains in upper separator (cm), respectively.

3- Converting the soil

$$F = \frac{W_a - W_b}{w} \times 100 \tag{4}$$

Table 1. Analyze of mean variance of square the properties evaluating concisely

S.O.V	df	Apparent special mass of soil	Average of grain seeds diameter	Converting of soil	No of green roots	Seed operation	Harvest index
Repeat	2	0.042	0.133	117.43	745.5	197165.8	3.7
Tillage method (A)	3	0.006 ^{N.S}	24.2 ^{**}	81.6*	385.8 ^{N.S}	403221.8*	65.59*
Error	6	0.004	1.53	96.06	1.8	28842.45	33.78
Type of rice (B)	1	0.206 ^{n.s}	0.007 ^{N.S}	208.2*	31.5 ^{N.S}	36689.5*	0.206 ^{N.S}
Interaction (A×B)	3	0.048 ^{N.S}	0.136 ^{N.S}	99.8*	19.89 ^{N.S}	5.45*	2.05*
Error	8	0.001	0.107	20.95	77	23873.23	1.304
C.V.(%)		9.92	7.95	7.54	12.35	10.4	13.59

n.s, * and **: Not significant, significant at 5% and 1% of probability levels, respectively.

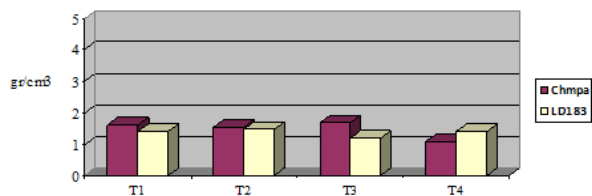


Fig 1. Mass of special appearance of soil

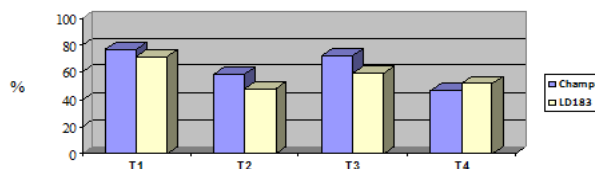


Fig 3. Converting value of soil

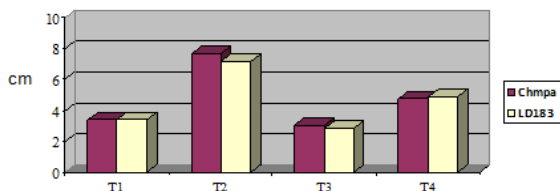


Fig 2. Mean of weight diameter of clays

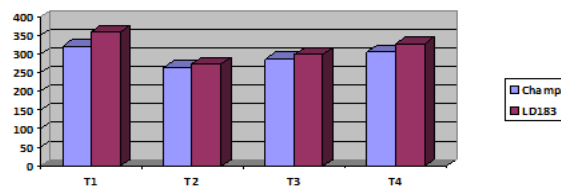


Fig 4. Number of green roots

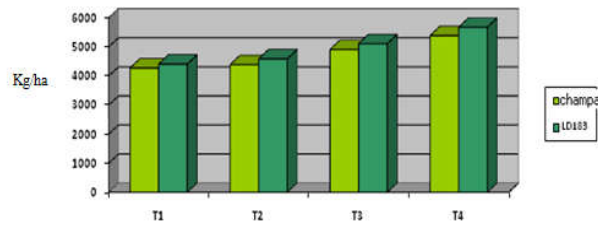


Fig 5. Operation of seed

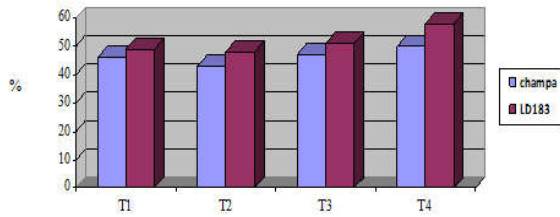


Fig 6. Index of harvesting

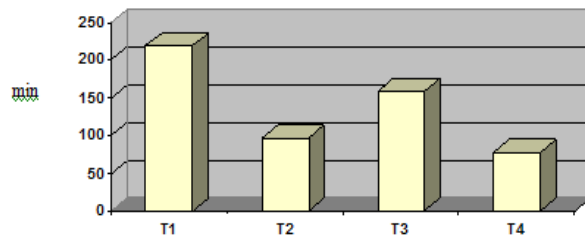


Fig 7. Time duration of working

Where w_a and w_b are dry weight of remaining plus herbicides before and after the operation.

4- Number of established roots per square meter

The number of established roots is calculated by:

$$M = \frac{PPSM}{(SPSM)(P)(G)} \quad (5)$$

Where PPSM, SPSM, P and G are number of established roots per square meter, number of farmed seeds per square meter, percentage of seeds purity and naming power, respectively.

5- Seed operation

After cancelling cert margin, three random points in a 100*100 (cm) fame were appointed, so harvesting and recognizing the weight of seed were done. Then seed operation was appointed in humidity of 14%.

6- Total time of working

To appoint total time of each method to prepare the land, sum of useful and machine rotating at first and end of the field farming in a suitable speed were measured by a time meter separately.

DISCUSSION AND CONCLUSION

The required calculations were done after collecting data, so the results were demonstrated in tables and diagrams as the

below. The results show that the tillage methods have a meaningful effect on value of fracturing the masses of soil. We can say that the timour T4 is the most useful method among the expressed ones why having a suitable situation in fracturing masses and so the corp operation with time would be optimized.

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