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ORIGINAL ARTICLE **OPEN ACCESS**

Effect of different irrigation system on growth and development of Wheat- Chickpea intercropping

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ABSTRACT
A field experiment was conducted to determine the growth, development and productivity in Wheat-Chickpea inter-cropping under different irrigation conditions. The experiment was done in 2017–2018 on a sandy loam soil of Lovely Professional University, Jalandhar, Punjab, India. As the experiment was mainly depends on different irrigation quantity of the sole Wheat-Chickpea crop and intercropping of wheat-chickpea showed immensely variations in different treatments. The highest plant height, leaf size and no of tillers found in the T_2 during the experiment. The best Irrigated treatment was T_2: RDF + Less irrigation which showed different variation on the growth and development parameters.
Key Words- *Chickpea, Irrigation, Intercropping, Wheat*

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INTRODUCTION

Wheat is the one of most essential cereal crops being developed over an extensive variety of areas around the globe. Numerous types of wheat which together make up the genus *Triticum* the most broadly grown wheat (*T. aestivum*). Wheat is known as the "King of cereal" for a considerable length of time and it retain the pride of place even today. Wheat is on the main sustenance grain eat by individuals and is evaluated that more than 35 percent of the total population relies upon wheat, as it supplies more supplements especially, essential amino acids than any other cereal crop [10-12].

Chickpea is known as less labour intensive crop and its production needs less external efforts in relation to cereals. Chickpea is generally grown all over the world and fills in as a multi-utilize crop. It assumes a huge part in enhancing soil fertility by fixing the atmospheric nitrogen. It can fix up to 140 kg N ha^{-1} from air and meet a large portion of its nitrogen need. After harvesting, it leaves considerable measure of residual nitrogen for consequent crops and provides some amount of organic manure in soil for enriching the soil fertility. This reduces the manure input cost for chickpea as well as for the next crop.

Intercropping of cereals and legumes is an ignored subject in agricultural science and practice in both conventional and natural cultivating frameworks [1-5]. The reason for intercropping is to create gainful organic associations between the products. Intercropping can expand grain yields and stability, efficiently utilize accessible resources, decrease weed interaction and maintain plant health [6-9]. Growing two or three crops in a single field and single time may lead to so many benefits that can be expressed in various space and timing. From a short time increase in yield and quality to a long time sustainability can be obtain easily.

MATERIAL AND METHODS

A field experiment was conducted on a sandy loam topsoil soil of Lovely Professional University, Jalandhar, Punjab having pH 7.1 during 2017-18. The climate of the area comes under Agro ecological sub region (northern plain, hot sub humid eco-region Punjab). The area comes under the semi arid zone with the annual rainfall of 527.1mm. The experiment was laid out in Randomize Complete Block Design (RCBD) with three treatments (Recommended Irrigation, Less Irrigation, High irrigation).

The present experiment was conducted in land of Wheat Chickpea intercropping. The crop varieties wheat (HD3086), chickpea (PBG-5) were sown in the last week of November. The wheat and chickpea were sown in the field as sole and as well as in intercropping. The size of the field was 450m^2 (Net plot size -432m^2). The planting distance for wheat was 30 cm in sole crop, for chickpea 30 cm and for intercropping 30 cm + 25 cm respectively. The treatment given to the different field condition was T_1: RDF+ Recommended irrigation, T_2: RDF + Less irrigation and T_3: RDF + High irrigation.
For the first treatment the total number of irrigation was given according to the recommended irrigation scheduling, for second treatment the irrigation was provided half of the recommended irrigation to the crops and for the third treatment irrigation was given 50% more than the recommended irrigation in field. For all the treatment the first irrigation was given at 15 Days After Sowing (DAS), the second irrigation was given accordingly T_1: 45DAS, T_2: 75DAS,T_3: 30DAS , third irrigation was given accordingly T_1: 75 DAS,T_2:105 DAS,T_3: 45DAS and the final irrigation was given only in T_1:125 DAS and T_3: 125DAS. The observation was recorded on morphology, biochemical and yield basis.

RESULT AND DISCUSSION

Yield attributes of wheat

As the experiment was mainly depends on different irrigation system the sole crop of wheat and intercropped showed immensely variations in different treatments. The best irrigated treatment was the T_1: RDF+ Recommended irrigation in Sole wheat brought about fundamentally more number of powerful tillers/m^2 and number of grains/spike In this case spike length and 1,000-grain weight of wheat stayed unaffected. But in the integrated crop which was Wheat +Chickpea, on that the best suited treatment was T_2: RDF+ Less irrigation by which the No. of tillers, plant height, spike length, yield got improved.

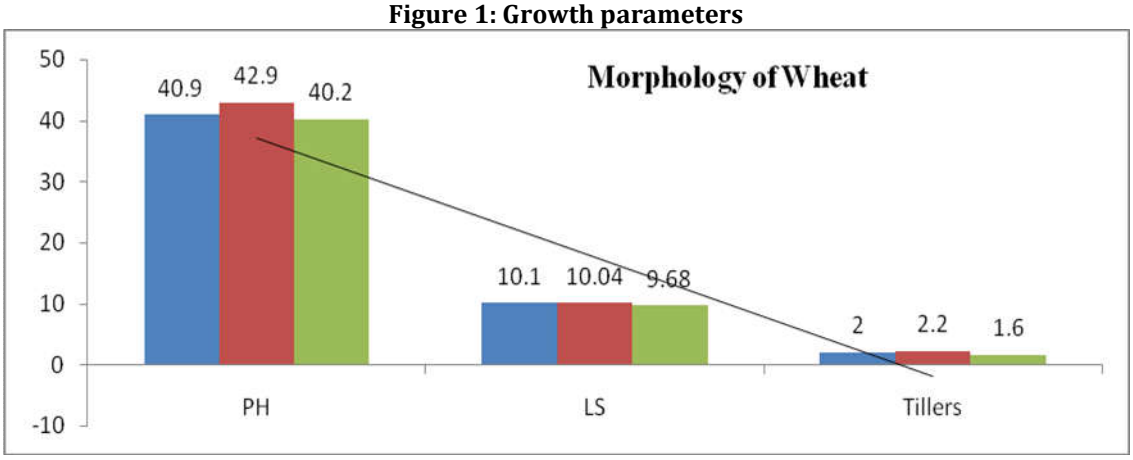
Yield attributes of chickpea-

The experiment was mainly depends on different irrigation quantity the sole crop of chickpea and intercropped chickpea showed immensely variations in different treatments. The best irrigated treatment which was T_2: RDF+ Less irrigation in sole chickpea brought out fundamentally a proper growth, development and yield of the crop. But the integrated crop which was Wheat+ Chickpea, on that best suited treatment was T_2: RDF+ Less irrigation which improved the No. of pods, No. of branches, No. of grains per plant and as well as the yield.

Table 1: Growth parameters of Wheat

Treatments	Plant height (Cm)	Leaf size (Cm)	No. of tillers per plant
T_1	40.2	10.04	1.6
T_2	40.9	9.68	2
T_3	42.7	10.04	2.2

Figure 1: Growth parameters



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