



# COMPARATIVE YIELD ANALYSIS OF PROMISING LENTIL (*LENS CULINARIS MEDIK.*) CULTIVARS UNDER RAIN FED CONDITIONS

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## KeyWords

Lentil varieties, yield performance, Photohar, Punjab

## ABSTRACT

Lentil is the second major Rabi pulse crop after chickpea in Pakistan. In Pakistan yield of lentil is less than its potential because of low usage of recommended varieties and fertilizer management. The present study has been conducted to evaluate and compare the yield potential of different recommended lentil cultivars under agro ecological conditions of Photohar Plateau of Pakistan. The experiment was conducted to evaluate the yield performance of Markaz-2009, Punjab-Masoor and Chakwal-Masoor at farmer's field at District Attock and Rawalpindi during Rabi season 2017-18, 2018-19 and 2019-20. Our results described that significant ( $P < 0.05$ ) plant height was recorded by Markaz-2019 (36.83cm) followed by Chakwal-Masoor (34.33cm) compared to other treatment. Significant ( $P < 0.05$ ) number of branches per plant was recorded by treatments Chakwal-Masoor (9.3) compared to other treatments in the studied ecosystem. Number of pods per plant recorded maximum in Punjab-Masoor (46.16) followed by Markaz-2019. Significant ( $P < 0.05$ ) number of seed per pod was recorded in Chakwal-Masoor (1.86) followed by Punjab-Masoor (1.60). Chakwal-Masoor produced maximum seed in the pod produced maximum thousand grain weight (24.40g) followed by Punjab-Masoor (19.90g) resulted to increase the yield in Chakwal-Masoor (802.20 kgha-1) followed by Markaz-2019. At the end it was concluded that Chakwal-Masoor showed better performance in term of yield and recommended for cultivation in photohar plateau of Punjab, Pakistan.

## Introduction

Pakistan is one of the major lentil growing country among South Asia. Lentil is the second major Rabi pulse crop after chickpea in Pakistan. The contribution of lentil cultivated under rain fed conditions found 79% of total area and 67% of total production in Punjab (GOP-2010). In Punjab the area under lentil cultivation is 16 thousand acres. Lentil contains 28% protein (Karimizadeh et al., 2012) and can be used as alternate to meat having high nutritional value. Apart from protein it contains carbohydrates, vitamin B, Iron, Calcium niacin and phosphorus. Besides high nutritional value, lentil maintain soil fertility through biological nitrogen fixation hence consider as restorative crop (Kannaiyan, 1994; Asthana & Chaturvedi, 1999). It was observed that the biological yield and number of pods per plant has direct relationship with seed yield (Abdipur et al, 2011). The yield analyzed by its components i.e. plant height, number of primary branches per plant, number of pods per plant, number of seeds per pod and 1000 seed weight (Chuhan and Singh, 2001; Younus et al 2008, and Bicer and Sarkar 2010). In Pakistan yield of lentil is less than its potential because the farmers did not use recommended varieties and fertilizer management strategies. Further intermittent and untimely rains and infestation of weeds are also major factors in its low yield. Therefore to overcome this problem the present study has been planned

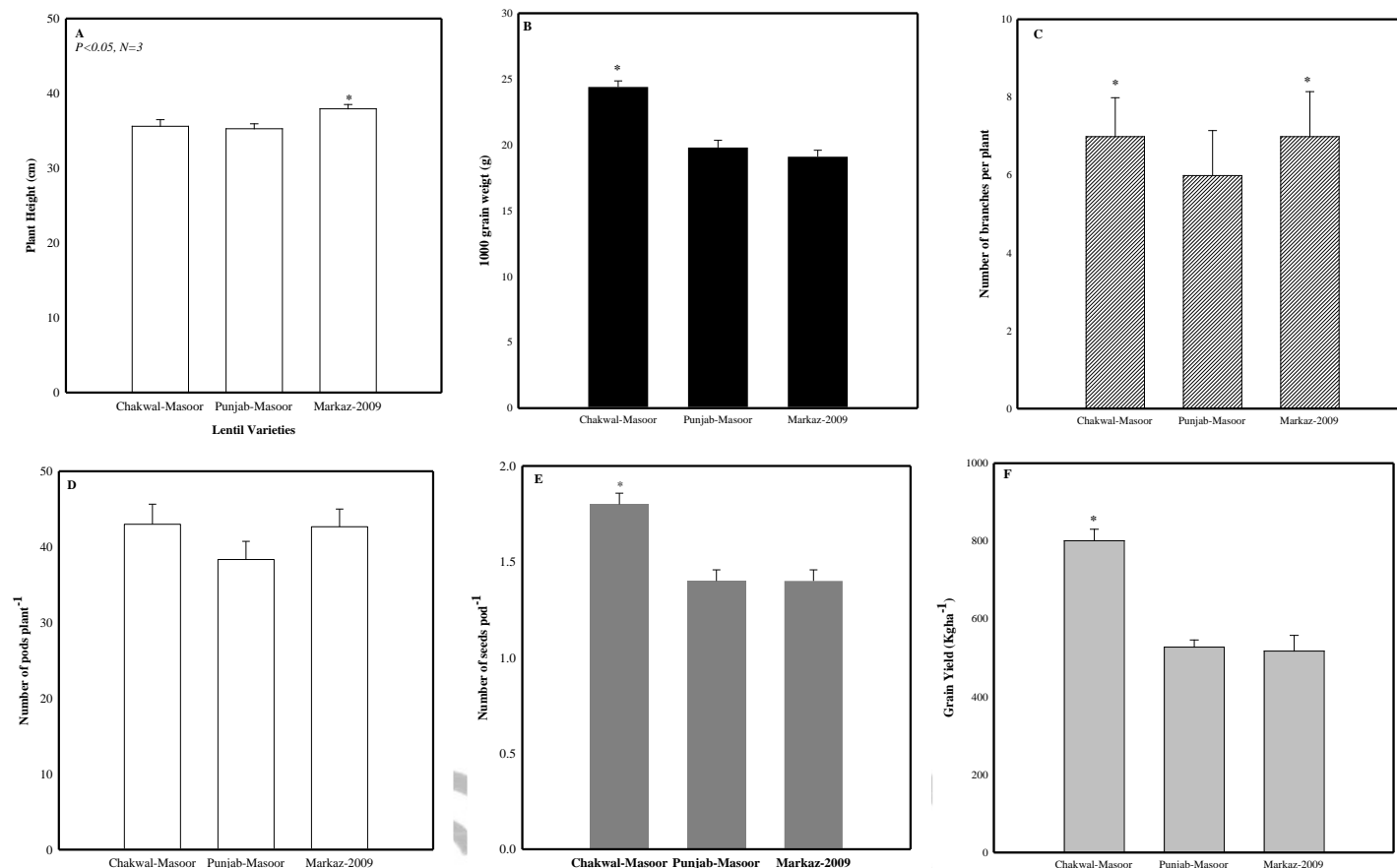
to evaluate and compare the yield potential of recommended lentil cultivars under agro ecological conditions of Photohar Pleatue of Pakistan.

### Materials and Methods

The experiment was conducted to evaluate the yield performance of three recommended lentil cultivars i.e Markaz-2009, Punjab-Masoor and Chakwal-Masoor at farmer's field at District Attock and Rawalpindi during Rabi season 2017-18, 2018-19 and 2019-20 respectively. The experiments were sown in Randomized complete block design using single row hand drill with 30cm row to row spacing. The seed rate used was 30 Kgha-1. The soil was prepared well and recommended dose of nitrogen and phosphorus was applied at the time of seed bed preparation. The weed plants were removed manually through hoeing practices. Ten plants per replication from each variety were selected randomly for recording yield parameters. The plant height was recorded from the base of plant near to soil zone to canopy area from ten plants by using measuring tape. The number of branches was counted from each ten randomly selected plants, however number of pods per plant were counted and opened manually and calculated thousand grain weight. The grain yield (Kg ha-1) obtained from two central rows of each plot in all the replications were harvested, sundried and weighed. The data was statistically analyzed by using single factor analysis of variance ANOVA and Sigma Plots software was used for graphical representation.

### Results and Discussion

Our results described that significant ( $P<0.05$ ) plant height was recorded by Markaz-2019 (36.83cm) followed by Chakwal-Masoor (34.33cm) compared to other treatment. Plant height of a crop is influenced by both genetic and environment factors. In present study the plant height did not differ significantly among the lentil cultivars (Figure 1A). The statistical data revealed that height of all the three tested cultivars were at par with each other. It means that the height of lentil remains same under similar agronomic practices and do not effect final yield of crop. These findings were contrary to those of (Abdel Rehman et al 2002) in which plant height has significant effect on seed yield. Significant ( $P<0.05$ ) number of branches per plant was recorded by treatment Chakwal-Masoor (9.3) compared to other treatments in the studied ecosystem (Figure 1C). Number of pods per plant recorded maximum in Punjab-Masoor (46.16) followed by Markaz-2019 (Figure 1D). In this study number of pods per plant and number of branches per plant showed non-significant ( $P>0.05$ ) behavior. These findings showed that number of pods and number of branches recorded non-significant ( $P>0.05$ ) role in yield of lentil. Our results are in-line with other researchers who gave similar recommendations in their experiments (Lopez-Bellido et al. 2005 and Piotr Kraska et al 2019).



**Figure 1 showing comparative yield analysis of promising lentil (*lens culinaris medik.*) cultivars under rain fed conditions** (Whereas the graphical representation data showed average of three seasons 2017-18; 2018-19 and 2019-2020)

From Figure 1E, significant ( $P < 0.05$ ) number of seed per pod was recorded in Chakwal-Masoor (1.86) followed by Punjab-Masoor (1.60). Chakwal-Masoor produced maximum seed in the pod produced maximum (Figure 1B) thousand grain weight (24.40g) followed by Punjab-Masoor (19.90g) resulted to increase the yield in Chakwal-Masoor (802.20 kg/ha<sup>-1</sup>) followed by Markaz-2019 (Figure 1F). Thousand seed weight is an important yield determining factor which contributes towards the final yield of the crop. It was studied earlier that in the final yield seed weight is an essential factor and difference in seed weight among different cultivars due to different genetic makeup of varieties (Noor R. et al 2017). Our results showed similar findings as recorded by early scientists in their experiments (Baksh et al 1993, Roy et al. 2013).

The yield of the crop is the combined expression of various yield components like number of seeds per pod, thousand grain weight (g), grain yield and other studied yield parameters that significantly influenced among different varieties. Our results are in accordance to the researchers who also given similar recommendations in their experiments (Azeem et al. 2015).

At the end it was concluded that Chakwal-Masoor showed better performance in term of yield and recommended for cultivation in photohar plateau of Punjab, Pakistan.

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