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## Performance of Different Rice Cultivars at Farmers' Field under the Agro-climatic Conditions of Dera Ismail Khan

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**Abstract:** Field experiments were carried out to study the performance of Gomal-6, Gomal-7, IR-6 and KS-282 at three different sites, Lunda Sharif, Jatti Qilla and Said Alian in farmers' fields in Dera Ismail Khan district for three years during 1999, 2000 and 2001. The data on days to 50% heading, plant height, number of tillers per hill and paddy yield were recorded. The data showed that Gomal-7 performed better than the other varieties followed by Gomal-6 variety of rice. It can be concluded from these studies that the new varieties Gomal-7 and Gomal-6 are better than the standard varieties of IR-6 and KS-282 for growing under the agro-climatic conditions of D.I. Khan.

**Key words:** rice, IR-6, KS-282, Gomal-6, Gomal-7 and D.I. Khan

### Introduction

Rice (*Oriza sativa* L.) is the world's single most important food crop and the primary food for more than one-third of the world's population (IRRI, 1991). It corresponds to approximately 10% of the global cultivated agricultural area (Howard-Williams and Downes, 1993) and contributes about 20% of the global natural freshwater wetland area (Aselmann and Crutzen, 1989). It is also the predominant crop in South and Southeast Asian countries, covering an area of 73.7 million ha (Gosh and Bhat, 1989). In Pakistan it occupies an area of 2.515 million ha with 5.156 million tons production (Anonymous, 2000).

The final grain yield or produce is outcome of genetic, cultural, climatic variations and soil productivity. Genetic potential of a variety is one of the major component in production increase. Therefore, different varieties introduction in an area is a continuous process. Abbasi *et al.* (1993) evaluated 25 early maturing rice varieties for their physiological efficiency to select the best one for their use in future breeding programmes. The data recorded revealed that grain yield ranged from 5230 to 7690 kg ha<sup>-1</sup>, biological yield from 11350 to 15950 kg ha<sup>-1</sup> and harvest index from 40 to 58%, respectively. Hassan *et al.* (1999) studied the performance of six rice cultivars (IR-6, JP-5, KS-282, Swat-I, Swat-II and DR-83) under high temperature of D.I. Khan with direct wet seeded conditions. The variety KS-282 outclassed other varieties in number of panicles per plant, height, spikelets per panicle, number of tillers per plant, straw and paddy yield and highest partitioning of the assimilates toward the economic yield. The maximum normal kernals (%) were observed in the KS-282 with a minimum sterility

percentage, as compared to other cultivars included in the trail. Similarly Saifullah *et al.* (2002) evaluated the performance of various rice cultivars (JP-5, Swat-I, Swat-II, Dilrosh-97, PARC-3, IET, 13711, IRRI-9, Gomal-6 and Gomal-7). They observed remarkable differences among the varieties where Dilrosh-97, Gomal-7 IET, 13711, Swat-II and JP-5 out yielded the rest of the cultivars included in the study.

Keeping in view the variable performance of different cultivars, the study was conducted for three consecutive years on different rice cultivars under the agro-climatic conditions of D.I. Khan.

### Materials and Methods

Three demonstration trials were laid out on farmer's fields to compare the performance of Gomal-6 and Gomal-7 with IR-6 and KS-282. These plots were laid out at Lunda Sharif, Said Alian and Jatti Qilla in Dera Ismail Khan district during the years 1999, 2000 and 2001. Plot size was kept as 1 acre for each variety. Transplantation of rice was done in the last week of June each year and harvesting in the month of October.

The data on days to 50% heading, plant height (cm) and number of tillers per hill were recorded for each variety. All the recommended cultural practices were followed throughout the growing season. Paddy yield was recorded from a net plot of 4 m<sup>2</sup> and converted to t ha<sup>-1</sup>. All the data recorded were analyzed statistically. Combined analysis of the three years data was done, putting years in the main plot and varieties in the sub-plot. Mean values for varieties were compared using LSD test of significance.

**Results and Discussion**

The data recorded on dates to 50% heading, plant height (cm), number of tillers per hill and paddy yield of different rice cultivars are discussed in the following paragraphs.

The data on days to 50% heading (Table 1) shows that the results were non-significant for varieties. However, IR-6 and KS-282 varieties took relatively more time to 50% heading than Gomal-6 and Gomal-7 varieties. If we consider the average time to 50% heading of rice for different years, it took significantly longer time to 50% heading during 2001 and 2002 than 1999.

As regards plant height of different varieties, the results were significant (Table 2). All the varieties were significantly different from one another. The maximum plant height was observed in IR-6 followed by KS-282 and

Table 1: Number of days taken to 50% heading as affected by different varieties during different years

Variety	Years			Mean
	1999	2000	2001	
Gomal-6	66.67	71.67	73.00	70.44
Gomal-7	65.67	73.00	73.00	70.55
IR-6	66.00	73.00	74.33	71.22
KS-282	64.00	74.00	73.00	70.44
Mean	65.58b	73.00a	73.41a	

Table 2: Plant height (cm) as affected by different varieties during different years

Variety	Years			Mean
	1999	2000	2001	
Gomal-6	100.00	102.36	104.33	102.23d
Gomal-7	106.33	107.33	105.67	106.44c
IR-6	119.67	120.33	120.67	120.22a
KS-282	115.67	116.67	116.33	116.22b
Mean	110.41	111.67	111.75	

Table 3: Number of tillers per hills as affected by different varieties during different years

Variety	Years			Mean
	1999	2000	2001	
Gomal-6	34.00	34.33	33.67	34.00a
Gomal-7	33.33	33.67	34.67	33.89a
IR-6	22.67	23.00	23.33	23.00b
KS-282	22.33	23.33	24.67	24.44b
Mean	28.08	28.58	29.08	

Table 4: Paddy yield (t h<sup>-1</sup>) as affected by different varieties during different years

Variety	Years			Mean
	1999	2000	2001	
Gomal-6	7.500	7.600	8.067	7.727b
Gomal-7	7.443	7.867	8.867	8.059a
IR-6	7.000	7.167	6.867	7.011c
KS-282	6.667	6.667	7.267	6.867dc
Mean	7.152b	7.325ab	7.767a	

Values followed by same letter(s) do not differ significantly at 5% probability level using LSD test

the minimum plant height of 102.23 cm in Gomal-6. It seems that Gomal-6 and Gomal-7 varieties are of short stature. The results are in similarity with Ilhamuddin *et al.* (1988) who obtained differential response of various genotypes for height in their studies. Khan *et al.* (1991) and Hassan *et al.* (1999) also reported varying height among rice cultivars in their results. The differences during the year were non-significant.

Number of tillers per hill (Table 3) was significantly affected by varieties. The highest number of 34 tillers per hill was observed in Gomal-6 but was at par with Gomal-7. IR-6 and KS-282 were comparable with each other and produced significantly lower number of tillers per hill than Gomal-6 and Gomal-7. It is clear that Gomal-6 and Gomal-7 are more productive than IR-6 and KS-282. Similar wider differences in numbers of tillers per plant have been observed by Saifullah *et al.* (2002). Year wise differences were non-significant.

Paddy yield of different varieties of rice (Table 4) was significantly different. The highest yield of 8.059 t ha<sup>-1</sup> was obtained from Gomal-7, which was significantly different from the other varieties. It was followed by Gomal-6 with a yield of 7.727 t ha<sup>-1</sup>. IR-6 and KS-282 produced significantly lower yields than Gomal-6 and Gomal-7. It is obvious from these results that the new varieties of Gomal-6 and Gomal-7 produced significantly higher yields than the old varieties of IR-6 and KS-282 under the agro-climatic conditions of D.I. Khan. These findings are in agreement with Hassan *et al.* (1999) who obtained differential response of different genotypes for the grain yield in their studies. Awan *et al.* (1998) and Saifullah *et al.* (2002) also reported significant difference among varieties for grain yield. Considering the varietal differences on different years it was observed that the average yield during 2001 was maximum suggesting the favorable conditions in the same year as compared to other years.

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