

## SHORT COMMUNICATION

**Suitability of Barley Varieties for Cultivation in Transitional Plain of Luni Basin of Rajasthan****NK Sharma***Swami Keshwanand Rajasthan Agricultural University's Agricultural Research Station, Keshwana, Jalore-343 001, Rajasthan*

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A total of 11 barley varieties were evaluated under irrigated normal soil and water situation for three years at Agricultural Research Station, Keshwana, Jalore. Sowing was done on November 19<sup>th</sup>, 29<sup>th</sup> and 19<sup>th</sup> in 2009, 2010 and 2011, respectively. Differences among varieties were found statistically significant for grain and biological yield. The maximum grain yield of 62.13 q/ha was provided by RD-2035, followed by RD-2508 and RD-2715 with the grain yield of 59.73 and 59.48 q/ha, respectively. RD-2035 produced maximum biological yield followed by RD-2592, RD-2552 and RD-2660 with 151.03, 144.70 and 144.63 q/ha, respectively. RD-2508 has the maximum test weight of 42.62 g followed by RD-2715 and RD-2552 with 42.25 and 41.42 g, respectively. Therefore, barley varieties RD-2035, RD-2508 and RD-2715 may be cultivated for realising the higher productivity under timely sown conditions of irrigated normal soil and water situation in Transitional Plain of Luni Basin of Rajasthan.

**Key Words: Barley, Grain yield, Irrigated situation, Varieties****Introduction**

Barley (*Hordeum vulgare* L.) belonging to Family Poaceae, is an important cereal crop of India cultivated widely under cool and dry weather conditions. It is used as food grain, raw material in beverage industries and fodder for animals (Verma *et al.*, 2005). Chapattis of mixed flour of barley, wheat and gram are highly palatable and digestible; and beneficial for human health particularly stomach ailment. In the modern time, it is popularly being preferred as medicinal food in urinary as well as diabetes problems (Verma *et al.*, 2005). In India, barley productivity witnessed significant increase during last 50 years after the development of high yielding varieties, improved crop management practices, enhanced irrigation facilities, use of fertilizers, bio-regulators and plant protection chemicals, farm machinery and implements, *etc.*

In western Rajasthan, barley is cultivated under three situations *viz.*, normal irrigated soil and water, problematic irrigated soil and water, and conserved moisture in low lying areas locally known as 'Sewaj' cultivation. The high temperature stress coupled with moisture stress during grain filling and development stage is now being faced a common problem in western Rajasthan, which is proving detrimental to the productivity of most of

the *rabi* crops. Tingle *et al.* (1970) reported that under high temperature conditions, the fertility of the spikelet declines, and if it coincides with grain development, reduces the length of the grain filling period considerably in wheat (Saini and Dadhwal, 1986), which ultimately results in low yield (Al-Khatib and Paulsen 1984; Ruwali *et al.*, 1988; Viswanathan and Khanna-Chopra 2001). Low humidity accompanied by high temperature, causes high evaporation and quick drying of soil (Ruwali and Prasad 1991; Aggarwal and Sinha 1984).

Under such adverse growing conditions, selection of suitable varieties for different situations and their seed availability to farmers attain paramount importance in harnessing the potential yield besides better crop management practices. Barley improvement programme is successfully developing high potential varieties for different agro-ecological situations of India. Besides that State Agricultural Universities (SAUs) are also developing many potential varieties for cultivation of their own states. But despite of the availability of newly developed high potential varieties, many of the old varieties are still occupying large area under cultivation due to poor extension and weak seed production and distribution system. In case of barley these obsolete varieties are characterised by their low yield and disease susceptibility and, therefore, there is an urgent need to

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replace them (Ortiz-Ferrara *et al.*, 2007) with newly developed high potential varieties for better production and profitability, and to maintain varietal diversity for sustainability of the system.

Hence, keeping the current requirement in view, a field trial on evaluation of barley varieties was conducted with the aim to find out high yielding varieties for timely sown conditions of irrigated normal soil and water situation in Transitional Plain of Luni Basin (Zone IIb) of Rajasthan.

### Materials and Methods

The experiment has been conducted for three years (2009-10 to 2011-12) at Agricultural Research Station, Keshwana, Jalore. The site is situated at latitude of 25°22'N and longitude of 72° 58'E, elevation 162 msl and has a tropical arid climate with mean annual rainfall of 421 mm. Soil at the site was clay loam slightly saline in reaction (pH 8.7), low in organic carbon (0.23 %) and Fe (1.9 µg/g), high in available P (97 kg/ha) and K (339 kg/ha) and normal in Zn (0.65 µg/g), Cu (0.66 µg/g) and Mn (5 µg/g). The pH and EC of irrigation water was 7.7 and 1.0, respectively.

A total of 11 released and notified varieties were tested in a Randomised Block Design with 3 replications under irrigated situation. Sowing was done on November 19<sup>th</sup>, 29<sup>th</sup> and 19<sup>th</sup> in 2009, 2010 and 2011, respectively accommodating 4 m long 10 rows per plot at 22.50 cm row distance with standard seed rate of 100 kg/ha. A fertilizer dose of 80 kg N, 40 kg P and 30 kg /ha was applied to the crop. A half dose of N and full dose of P and K were applied at the time of sowing, in the form of urea, DAP and MoP. The remaining half dose of the N was top dressed in the form of urea in two splits at the time of first and second irrigation. Foliar spray of zinc sulphate 0.2% at tillering stage, 1% soluble NPK (19:19:19) at flowering stage and thiourea 500 ppm at grain development stage were also applied to the crop for harvesting the higher yield. Total six flood irrigations, each of about 6 cm depth were applied as per the requirement of the crop. Two hand weeding were also carried out at 25 and 45 days after sowing to have the crop free from weeds. Data recorded for biological yield and grain yield for 3 years and test weight in third year only were analysed using standard analysis of variance

(ANOVA) technique through Excel software of Microsoft Office.

### Results and Discussion

Differences among barley varieties for grain yield were found statistically significant. Variety-wise average grain yield ranged between 47.80 q/ha to 62.13 q/ha with the overall average of 55.29 q/ha. The maximum grain yield of 62.13 q/ha was provided by RD-2035, followed by RD-2508 and RD-2715 with the grain yield of 59.73 and 59.48 q/ha, respectively. The lowest grain yield was provided by variety RD-2668. Kaur *et al.* (2009) and Pal and Kumar (2009) also reported significant differences among barley genotypes evaluated for dual purpose cultivation. Year wise grain yield ranged between 41.12 q/ha to 67.62 q/ha, which may be attributed due to change in the environmental and climatic conditions over the years.

Differences among varieties for biological yield were also found statistically significant. Variety-wise average biological yield ranged between 124.29 q/ha to 156.51 q/ha with the over all average of 135.99 q/ha. The maximum biological yield was provided by RD-2035, followed by RD-2592, RD-2552 and RD-2660 with 151.03, 144.70 and 144.63 q/ha, respectively. The lowest biological yield was provided by variety RD-2508. Year-wise biological yield ranged between 103.33 q/ha to 173.05 q/ha. The difference in the biological yield over the years may be attributed due to change in the environmental and climatic conditions.

One thousand grain weight of barley varieties recorded in third year only ranged between 36.89 to 42.62 g with the overall average of 39.77 g. The maximum test weight was provided by RD-2508, followed by RD-2715 and RD-2552 with 42.25 and 41.42 g, respectively, however, minimum test weight was found in variety RD-2660.

Barley varieties have a wide range of variability in grain yield, biological yield and 1000 grain weight. Grain and biological yield of barley were also varied considerably under different growing seasons and sowing dates. Therefore, most promising and appropriate varieties of barley *viz.*, RD-2035, RD-2508 and RD-2715 should be sown around mid November for realising the higher

**Table 1. Grain and biological yield of barley varieties under irrigated situation**

Varieties	Grain yield (q/ha)				Biological yield (q/ha)				1000-grain wt. (g)
	2011-12	2010-11	2009-10	Mean	2011-12	2010-11	2009-10	Mean	
RD 2503	64.33	43.78	46.62	51.58	154.10	106.83	112.50	124.48	39.90
RD 2508	66.33	49.54	63.33	59.73	133.37	100.00	139.50	124.29	42.62
RD 2035	69.70	48.09	68.60	62.13	200.17	114.68	154.67	156.51	39.31
RD 2052	62.57	36.60	56.53	51.90	172.47	90.13	125.33	129.31	40.27
RD 2552	70.50	36.35	60.53	55.79	193.17	104.60	136.33	144.70	41.42
RD 2592	70.73	37.93	63.29	57.32	191.20	108.15	153.73	151.03	39.17
RD 2624	64.33	35.40	51.47	50.40	158.67	99.33	123.40	127.13	39.22
RD 2660	71.10	34.55	60.40	55.35	206.13	92.42	135.33	144.63	36.89
RD 2668	66.17	36.97	40.27	47.80	204.63	102.58	103.00	136.74	39.53
RD 2715	73.83	47.87	56.73	59.48	143.17	108.62	133.67	128.49	42.25
PL 751	64.17	45.18	60.73	56.69	146.47	109.33	130.17	128.66	36.92
Mean	67.62	41.12	57.14	55.29	173.05	103.33	131.60	135.99	39.77
SEm±	1.59	1.65	5.46	-	6.07	4.83	9.31	-	-
CD (p=0.05)	4.68	4.81	16.10	-	17.91	14.08	27.48	-	-
CV (%)	4.06	7.12	16.54	-	6.08	8.23	12.26	-	-

yield under irrigated normal soil and water situation in Transitional Plain of Luni Basin of Rajasthan.

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