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Response of Mustard (*Brassica juncea* L.) to Varying Levels of Irrigation Based on IW : CPE Ratio

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Mustard occupies an area of 3.8 million hectares with production of 2.64 million tonnes in India (Anon, 1986). It is generally grown with limited amount of irrigation water. Under limited water, it is necessary to use water efficiency by adopting suitable irrigation schedule. Hence the present experiment was undertaken at the College Farm, Gujarat Agricultural University, Navsari during *rabi* season of 1987-88 to study the response of mustard to varying levels of irrigation based on IW:CPE ratio of 0.4 (I_1), 0.6 (I_2), 0.8 (I_3) and irrigation given at branching and pod formation stages of crop growth (I_4). Two common irrigations each of 60 mm depth were given for establishment of the crop. The remaining irrigations of equal amounts (60 mm) were given as per treatment. The soils of experimental field was clayey having more than 70 per cent clay. The crop was fertilized with 75 kg N/ha and 25 kg P2O5/ha and it was sown with 45 x 15 cm spacing on 2nd November, 1987 and harvested on 25th February, 1988.

TABLE 1

Effect of irrigation levels on seed and stover yield, consumptive use and water use efficiency of mustard crop.

Treatments	*Number of irrigations applied*	*Stover yield (kg/ha)*	*Seed yield (kg/ha)*	*Total quantity of water applied (mm)*	*Consumptive use of water (mm)*	*Water use efficiency (kg/ha-mm)*
I_1	4	3975	1121	240	223	5.03
I_2	5	4235	1272	300	278	4.57
I_3	6	4519	1354	360	317	4.28
I_4	4	3457	1061	240	216	4.92
S.Em.		55.56	13.58			
C.D. at 5%		191.36	46.91			
C.V. %		5.86	4.60			

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The data given in Table 1 revealed that irrigation treatments produced significant effect on seed stover yield of mustard. The treatment I_3 (IW:CPE ratio 0.8) recorded significantly the highest seed yield of 1354 kg/ha and stover yield of 4519 kg/ha. Whereas the lowest seed yield of 1061 kg/ha and stover yield of 3457 kg/ha was recorded in the treatment I_4. This may be due to higher number of irrigations (six) and quantity of water (360 mm) received by the treatment I_3 which resulted in to favourable growth and development of plants and reflected in seed and stover yield. Similar results were also reported by Bhan (1979) and Reddy and Pandey (1980).

The data given in Table 1 also indicated that the consumptive use of water was increased whereas water use efficiency was found to be decreasing with the increased number of irrigations. The consumptive use of water was the highest (317 mm) under the treatment I_3 (IW : CPE ratio 0.8). This indicated that the moisture absorption and utilization was higher when water supply was adequate. But the water use efficiency was the highest (5.04 kg/ha-mm of water) in the treatment I_1 (IW : CPE ratio 0.4) because of low harvest in I_4 (1061 kg seed/ha). Though the number of irrigation were the same (four) in both the treatments I_1 and I_4, the yield harvested under the treatment I_4 was significantly low compared to I_1 because irrigations were given only at branching and pod formation stages in the treatment I_4, this might have created moisture stress conditions situation during pre-flowering and flowering stages. Jain and Jain (1979) also observed a similar trend with respect to consumptive use of water and water use efficiency in mustard.

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