

Agronomic inputs for higher productivity of mustard (*Brassica juncea*) in Rapti diara of eastern Uttar Pradesh

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ABSTRACT

A field experiment was conducted during the winter seasons of 1988–89 and 1989–90 to study the effect of various agronomic inputs on the productivity of 'Varuna' mustard [*Brassica juncea* (L.) Czernj. & Cosson] of Rapti Diara in eastern Uttar Pradesh. Maximum seed yield was obtained where irrigation, fertilizer and plant-protection measures were given during both the years. Fertilizer alone proved its superiority to irrigation and plant-protection measures tested alone. Further, irrigation alone was found to be significantly superior to the plant-protection measures in increasing the seed yield. Similar pattern was observed in case of all yield attributes too.

Diara land have problems of floods during monsoon period and drought during pre- and post-flood periods. Uncertainty in the onset and recession of flood generally results in complete failure of early rainy-season crops and delay in winter-season crops. Low coverage with improved high-yielding varieties in major cereals and their complete absence in case of other crops, inappropriate use of chemical fertilizers and plant-protection measures for the cultivation of these crops are the common features of these areas. Mustard [*Brassica juncea* (L.) Czernj. & Cosson] can be grown under a wide range of agro-climatic condition varying from unirrigated and unmanured to irrigated and high-fertility conditions. Fertilizer, irrigation and plant-protection measures play a significant role in its production, but no information is available for these problematic areas. Hence the

present investigation was carried out to determine the role of agronomic inputs for higher productivity of mustard in diara of eastern Uttar Pradesh.

MATERIALS AND METHODS

The field experiment was conducted during the winter seasons of 1988–89 and 1989–90 in the area pertaining to diara of Rapti river in eastern Uttar Pradesh, located at Patnaghat, Gorakhpur. The experimental soil was alluvial sandy loam, having pH 7.6 and organic carbon 0.43%. Available phosphorus, potassium and total nitrogen were 24.30, 224.96 and 338.45 kg/ha respectively. Total rainfall received during the growth period of mustard crop was 47.1 during 1988–89 and 52.4 mm during 1989–90. Variety 'Varuna' was sown at a row distance of 45 cm on 17 November during 1988–89 and on 21 November during

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Table 1. Yield-attributing characters and yield of mustard as affected by various agronomical inputs

Treatment	Plant height (cm)		Siliquae/plant		Siliqua length (cm)		Seeds/siliqua		1,000-grain weight (g)		Yield (q/ha)		Increase over control (%)	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Control	103.67	93.02	86.77	77.74	4.16	3.98	10.44	10.09	3.05	3.00	4.96	3.77		
Plant protection	120.87	114.59	129.77	114.86	4.38	4.21	10.94	10.45	3.52	3.38	5.51	5.04	11.09	33.68
Irrigation	130.59	115.42	136.26	129.26	4.44	4.25	11.12	10.79	3.73	3.60	6.52	5.59	31.45	48.27
Fertilizer	157.86	146.43	183.75	175.63	4.69	4.49	12.22	11.77	4.32	4.25	9.17	8.65	84.88	129.44
Irrigation + plant protection	135.92	128.03	143.60	134.10	4.57	4.30	12.22	11.02	3.77	3.71	7.01	6.55	41.33	73.74
Fertilizer + plant protection	174.55	151.16	196.23	185.23	4.75	4.56	12.26	11.84	4.51	4.35	11.58	9.84	133.47	161.01
Fertilizer + irrigation	184.45	169.53	204.20	188.63	5.13	4.64	12.77	12.13	4.60	4.44	16.52	14.90	233.06	295.23
Fertilizer + irrigation + plant protection	196.90	187.43	242.55	228.13	5.37	4.99	13.99	13.43	4.97	4.82	18.51	17.04	273.19	351.99
CD (P = 0.05)	4.10	9.8	25.91	25.17	0.36	0.38	1.43	1.16	0.08	0.07	3.90	1.66		

A, 1988-89; B, 1989-90

1989–90 in present experiment.

The treatments consisted of recommended schedule of irrigation, plant protection and fertilizer alone and in their various combinations. The experiment was tested in randomized block design with 3 replications. Mustard was given 2 irrigations. First irrigation was given 25 days after sowing, whereas the second before pod-initiation stage. To save the crop from mustard sawfly at the primary stage, thiodan was sprayed and democron was sprayed 2 times at 15-day intervals during December–January to control the attack of aphids. Nitrogen as urea was applied in splits, half before sowing and the remaining was top-dressed in 2 equal splits. A basal dose of 40 kg each of P_2O_5 and K_2O /ha in the form of superphosphate and muriate of potash was drilled in the rows.

RESULTS AND DISCUSSION

Growth and yield attributes

Agronomic inputs had marked effect on growth and yield attributes (Table 1). Application of fertilizer, irrigation and plant-protection measures significantly increased the plant height, siliquae/plant, siliqua length, seeds/siliqua and 1,000-grain weight over all other inputs tested alone. Application of fertilizer alone showed improvement in plant height as well as in all the yield attributes, which was followed by irrigation alone and plant protection alone during both the years. Further, among the combination of 2 agronomic inputs, fertilizer coupled with irrigation proved its superiority statistically in increasing the yield attributes

(Roy and Tripathi 1985).

Yield

Agronomic inputs tested alone as in combination increased the yield over the control (Table 1). However, during 1988–89 irrigation, plant-protection measures alone as well as in combination remained at par with the control in increasing the yield. During 1989–90 plant-protection measures alone did not increase the yield significantly over the control, but irrigation alone and in their combination with plant protection too increased the grain yield significantly, as also reported by Roy and Tripathi (1985). Fertilizer alone proved its superiority to other agronomic inputs. Further, fertilizer coupled either with irrigation or plant-protection measures significantly increased the grain yield. Bhan (1979) also reported corroborative results. Grain yield increased by 273.19 and 351.99% over the control where fertilizer, irrigation and plant-protection measures were applied. The results confirm the findings of the Bhati and Rathor (1982).

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