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Effect of phosphorus and plant-growth regulators on blackgram (*Phaseolus mungo*)

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The field experiment was conducted at Research farm of Rajasthan College of Agriculture, Udaipur, during the rainy season, (*kharif*) of 1990 to study the effect of plant-growth regulators and phosphorus on blackgram (*Phaseolus mungo* L.). The soil was clay loam in texture and alkaline in reaction (pH 8.2). The available P was 16.8 kg/ha in the soil. Ten treatment combinations comprised 2 levels of P (0 and 40 kg P_2O_5/ha) and 5 levels of plant-growth regulators, viz. 2 levels of morphactin (10 and 20 ppm) 2 levels of etheral (120 and 240 ppm) and a water spray as control, were tried in randomized block design with 3 replications. Blackgram variety 'T 9' was sown on 7 July 1990.

Application of 40 kg P_2O_5/ha significantly increased the number of pods/plant, test weight, grain yield, stover yield and biological yield (Table 1). There was 22, 15 and 17% increase in grain, stover and biological yields, respectively with the application of 40 kg P_2O_5/ha over the control. These results are in confirmity to the findings of Venkateshwarlu *et al.* (1988). The significant effect of plant-growth regulators was observed on number of pods/plant, test

Table 1. Effect of phosphorus and plant-growth regulators on yield attributes and yield of blackgram

Treatment	Pods/ plants	Grains/ pod	Test weight (g)	Grain yield (q/ha)	Stover yield (q/ha)	Biological yield (q/ha)
P_2O_5 (kg/ha)						
0	18.0	5.4	36.78	6.75	18.3	25.05
40	21.4	5.7	38.77	8.20	21.1	29.30
CD (P = 0.05)	0.34	NS	0.048	0.02	1.28	1.28
Plant-growth regulators						
Control	17.4	5.3	37.19	6.74	18.6	25.34
Morphactin 10 ppm	18.7	5.2	37.76	7.20	19.2	26.40
Morphactin 20 ppm	19.8	5.6	37.87	7.41	19.2	26.40
Etheral 120 ppm	20.8	5.7	37.99	7.76	20.1	27.80
Etheral 240 ppm	21.9	5.8	38.05	8.31	21.3	29.61
CD (P = 0.05)	0.54	NS	0.076	0.03	NS	2.02

Table 2. Interaction effect of phosphorus and plant-growth regulators on test weight and grain yield of blackgram

P_2O_5 (kg/ha)	Plant-growth regulator				
	Control	M_{10}	M_{20}	E_{120}	E_{240}
			Test weight		
P_0	36.02	36.91	36.93	37.00	37.05
P_{40}	38.36	38.62	38.81	38.98	39.06
CD (P = 0.05)	0.338				
			Grain yield (q/ha)		
P_0	5.99	6.50	6.72	7.01	7.51
P_{40}	7.49	7.81	8.10	8.50	9.12
CD (P = 0.05)	0.014				

M_{10}, Morphactin 10 ppm; M_{20}, morphactin 20 ppm; E_{120}, etheral 120 ppm; etheral 240 ppm

weight, grain yield and biological yield (Table 1). Both the levels of morphactin and etheral significantly increased the number of pods/plant, test weight and grain yield over the control by 7, 10, 15 and 23% respectively. This may be attributed to cumulative effect of increase in the number of pods/plant, grains/pod and test weight. Similar findings were reported by Tiwari *et al.* (1992) with groundnut.

The interaction effect of phosphorus and plant-growth regulators was significantly with respect to test weight and grain yield (Table 2). Maximum test weight (39.06 g) and grain yield (9.12 q/ha) was recorded with the combined application of 40 kg P_2O_5/ha and etheral @ 240 ppm. The highest grain yield with this combination was attributed to more pronounced individual effect of 40 kg P_2O_5/ha and etheral @ 240 ppm on pods/plant and test weight (Table 1) and their synergistic interaction effect on test weight (Table 2).

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