GAU Res. J. 1991. 16 (2) : 71-72

Effect of Nitrogen and Phosphorus on Grain Yield and Nutrients Uptake by Amaranth

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Three species of the genus Amarnathus viz., *A. hypochondriacus, A. cruents* and *A. caudatus* produce large seed heads loaded with edible seeds[3]. Amaranth grain has about 16 per cent protein with high content of lysin[2]. Amaranth can be used for soups, Bilaf, Breads, Porridge and Crepes preparations[1].

A field experiment with two types of amaranths, Rajagara and Rajagari, was conducted to study the effect of nitrogen and phosphorus on grain yield and their uptake. Four levels of Nitrogen (0, 25, 50 and 75 kg N/ha) and two levels of phosphorus (0 and 25 kg P_2O_5/ha) were studied. Nitrogen and phosphorus were given in the form of urea and single super phosphate, respectively. The soil of the experimental area was loamy sand (inceptisol) having low nitrogen, medium phosphorus and adequate potassium.

TABLE 1

Effect of nitrogen and phosphorus on grain yield (kg/ha) and nutrients uptake (kg/ha).

Grain yield (kg/ha)				*Nitrogen uptake (kg/ha)*				*Phosphorus uptake (kg/ha)*			
Nitrogen		*Phosphorus*		*Nitrogen*		*Phosphorus*		*Nitrogen*		*Phosphorus*	
N_0	1667	P_0	1818	N_0	39.07	P_0	46.42	N_0	16.17	N_0	17.93
N_{25}	1887	P_{25}	1998	N_{25}	50.20	P_{25}	52.05	N_{25}	19.49	P_{25}	20.33
			Variety				**Variety**				**Variety**
N_{50}	1972	V_1	1903	N_{50}	52.78	V_1	49.18	N_{50}	19.38	V_1	18.38
N_{75}	2125	V_2	1913	N_{75}	54.88	V_2	49.29	N_{75}	21.48	V_2	19.88
	S. Em. ±	CD at 5%		S. Em. ±	CD at 5%			S. Em. ±	CD at 5%		
N	66.94	190.82		1.83	5.22			0.69	1.95		
P	47.33	134.93		1.29	3.69			0.48	1.38		
N x V	94.67	NS		2.59	NS			0.97	NS		
P x V	66.94	NS		1.89	NS			0.68	NS		
N x P x V	133.88	NS		3.66	NS			1.37	NS		
CV%		14.03			114.88				14.27		

Data presented in Table 1 indicate that the grain yield differences due to nitrogen and phosphorus were significant. As level of nitrogen increased from N_0 to N_{75}, the yield increased. All levels of appliled N were significantly superior to No levels however, N_{50} was at par with N_{25} and N_{75}. Similarly application of P_{25} gave significantly higher yield over control. The varieties did not differ significantly from each other.

The uptake of nitrogen and phosphorus by grains increased significantly with increasing levels of nitrogen and phosphorus. All the interaction effects were found non-significant.

(Received on 20th June 1990)

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