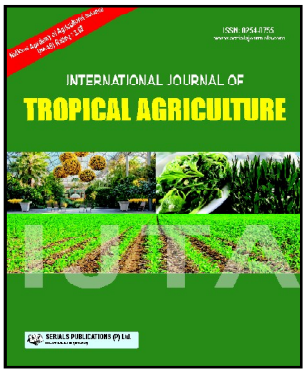

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Response of Boron to Different Wheat Varieties Under Late Sown Condition

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Abstract: Effect of boron on late sown condition in wheat was studied during 2008-2009 with ten wheat varieties (K0 303, CBW 38, HD 2733, K0 607, K0 617, PBW 612, HUW 612, HUW 616, DBW 39 and RAJ 4120) in new alluvial soil of west Bengal. Genotypic variability was found among the varieties on the aspect of plant height, number of days to 50 % flowering, number of days to 50 % maturity and spike length. Variety like 'K0 617' and 'RAJ 4120' showed highest significant value in case of grain number per spike. Varieties like 'PBW 612', 'HUW 612' and 'HUW 616' did not able to show any remarkable results. In case of 100 grain weight overall performance of wheat varieties like 'HD 2733', 'K0 607' and 'PBW 612' were remarkably good. Nitrogen content in all the varieties differed due to their genotypic variability.

Key words: Borax, genotypic variability, nitrogen content.

INTRODUCTION

In west Bengal wheat growing climate is widely different than other states where the duration is about 140-150 days. In west Bengal winter persists only 100-110 days. Thus, an ideal climate requires for optimum wheat crop is meager in the state. Moreover, wheat is generally grown after the harvest of the aman rice resulting delay in sowing (late sown

Table 1

Effect of boron on grains/spike, 100 grain weight and on nitrogen content of different varieties (V) of wheat

	Grains/spike						*100 grain weight (g)*						*N content (mg)*					
Varieties	*B0*	*B3*	*% I/D*	*B4*	*% I/D*	*Mean*	*B0*	*B3*	*% I/D*	*B4*	*% I/D*	*Mean*	*B0*	*B3*	*% I/D*	*B4*	*% I/D*	*Mean*
K0 303	41.93	48.26	15.0	45.33	15.09	45.17	3.82	4.48	17.27	4.73	23.82	4.34	1.494	0.974	–3.48	1.193	–2.04	1.22
CBW 38	26.13	40.26	54.0	39.40	50.86	35.26	3.86	4.44	15.03	4.10	6.22	4.13	1.109	1.058	–4.50	1.295	1.67	1.56
HD2 733	31.46	39.13	24.0	43.46	3.82	38.00	4.02	4.96	23.38	5.20	29.36	4.72	0.966	0.049	–9.50	1.109	1.48	1.08
K0 607	41.33	42.86	3.7	48.60	17.60	44.26	4.08	4.62	13.24	5.01	22.80	4.56	1.092	1.025	–0.62	0.823	–2.46	0.99
K0 617	50.93	54.60	7.2	54.73	7.46	53.42	3.50	4.54	23.72	4.86	38.86	4.30	1.025	1.075	4.89	1.344	3.12	1.15
PBW 612	40.06	38.60	–3.6	38.80	–3.15	39.10	3.64	5.18	42.30	5.03	38.19	4.61	1,361	1.119	–17.78	1.123	–17.48	1.21
HUW 612	49.80	47.13	–5.3	43.13	–1.34	46.60	3.73	4.49	20.38	5.30	42.09	4.65	1.125	1.344	19.47	0.934	–16.98	1.14
HUW 616	49.60	49.66	0.12	41.93	–1.55	47.07	3.72	4.51	21.24	5.13	37.90	4.45	1.085	1.126	3.78	1.176	8.39	1.13
DBW 39	39.79	46.73	17.60	41.86	5.20	42.70	4.34	4.68	7.84	4.86	11.99	4.62	1.126	1.092	–.3.02	0.940	–16.52	1.06
RAJ 4120	39.86	46.60	16.90	50.33	26.27	50.50	4.06	4.38	7.89	4.66	14.77	4.36	0.912	0.610	–3.31	0.941	3.17	0.83
Mean	41.08	45.38		44.75			3.87	4.62		4.88			1.130	1.037		1.088		
	B	V	V × B				B	V	V × B				B	VB	V × B			
LCD ($P = 0.05$)	NS	4.16	7.21				0.208	0.260	0.363				NS	0.1239	NS			

Note: B = Boron, V = Variety, I = Increase, D = Decrease, B0= 0 kg Boron, B3= 3kg Boron and B4= 4kg Boron.

condition). Beside, wheat crop is affected due to sudden rise in temperature resulting initiation of reproductive phase. During grain development phase the temperature exceeds 35°C. This reduces the grain size and grain filling which ultimately results substantial loss in wheat yield. Though the number of studies on grain size have been made, no studies nave been made on incomplete grain filling (sterility) as well as affect of boron application on grain filling under new alluvial soil zone. Therefore, the present studies have been made on above objective in addition to nitrogen content of the whole plant.

MATERIALS AND METHODS

The experiment was conducted during the year 2008-2009 at Instructional Farm, Jaguli of Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia with ten varieties of bread wheat (K0 303, CBW 38, HD 2733, K0 607, K0 617, PBW 612, HUW 612, HUW 616, DBW 39 and RAJ 4120) in new alluvial soil of West Bengal sown on 20th December in split plot design with three replications in 2015. Three doses of Boron in the form of sodium borate (0 kg, 3kg and 4kg/ha) as main plot and different wheat varieties in the sub plot was considered. Nitrogen (N) as urea, phosphorus as single super phosphate and potassium through muriate of potash were applied @ of 80kg, 60kg and 40kg per hectare respectively. Plot size 3m x 2.3m was maintained. Broad casting of phosphorus and potassium along with nitrogen at recommended dose was done during land preparation and top dressing of nitrogen was also done in due time of crop growth stage. Boron was applied at time of sowing. Inter-row and inter-plant spacing's were 23 cm and 15 cm respectively. Soil samples were collected before fertilizer application. Data on height of plant, number of days to 50 % flowering and days to 50 % maturity, number of grains per spike, spike length and 100 grain weight were recorded from each plot. Soil boron soluble in hot water was estimated by the method of Parkar and Gardner (1981).

RESULTS AND DISCUSSION

It is revealed from the analysis of soil samples that the boron soluble in hot water was 0.5 ppm which is considered as deficient soil according to Reisenaur *et al* (1973). Analysis of variance revealed that application of borax increased grain number per main spike and 100 grain weight of wheat. Similar results were obtained by Ganguly (1979) and Mandal (1991) who conducted their experiments at highly boron deficient soil of Coochbehar in west Bengal. A similar result was also obtained by Mandal (2000) at Jhargram in west Bengal. Percent increase in grains per spike parameter varied widely from -5.36 to 54.07 % at 3 kg borax/ha application. Varieties like 'CBW 38' and 'HD 2733' showed significant increase in number of grains per spike. Varieties *viz*, 'PBW 612' and 'HUW 612' did not perform well and showed negative value due to toxic effect of borax. But at 4 kg/ha borax application treatment, 'CBW 38' and 'RAJ 4120' showed significant increase in grain number per spike. At 3 kg level of borax application treatment all the varieties increased in 100 grain weight except for 'DBW 39' and 'RAJ 4120" varieties. At 4 kg/ha borax application treatment, all the varieties except 'CBW 38' increased 100 grain weight. Nitrogen content in all the varsities showed non-significant variation due to borax application at any applied level. The same result was found by Mandal (1994). Nitrogen content in different varieties was different due to the varietal response.

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