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Studies on tillering habit and yield of some *Kharif* rice cultivars as influenced by transplanting date under terai region of West Bengal

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ABSTRACT

A study was conducted at the research farm of Uttar Banga Krishi Viswavidyalaya Pundibari, Cooch Behar, West Bengal to find out the effect of transplanting date on yield of eight kharif rice cultivars during of two consecutive years, 2005 and 2006. The experiment was laid out in a split plot design with three replications. Results showed that due to higher conversation of light energy into chemical energy and its subsequent translocation from source to sink in earlier followed by middle and late grain yield was found also higher in the sequence of earlier > middle > late. All the cultivars under the different transplanting dates are taking more or less the same time to get maturity. Irrespective of cultivars rice grain yield decrease over 300 kg/ha for every 20 days delay in transplanting. The grain yields in short (Hira, 1.31 t/ha) and mid duration (Mala, 1.94 t/ha : Satabdi, 1.96 t/ha) varieties were lower than of long duration (Swarna, 2.41 t/ha) varieties, which may due to lesser number of productive tillers per m^2, number of field grains per panicle and test weight.

Key Words **:** Cultivars, rice, transplanting date, tiller, yield

Rice is one of the important cereal food crops of global significance. Rice is a tropical and subtropical crop grown throughout the states of India. In West Bengal, rice is cultivated in three different seasons which are *Aus*, *Aman* and *Boro*. In terai region of West Bengal, a vast rice growing area particularly confined to *kharif* cultivation and mostly depending on monsoon shower where rice based cropping system is practiced by the farmers. Among the crop production tools, proper time and method of sowing are the prerequisites that allow the crop to complete its life phase timely and successfully under a specific agro-ecology (Baloch *et al*., 2006). For successful rice production, timely planting, and proper agronomic practice are essential for improving the growth variables responsible for high yield (Ghosh and Singh, 1998). Cultivation of local cultivar of rice took place a considerable area in this region. Hence, a study was undertaken to find out suitable date of transplanting and suitable rice cultivar in terai region of West Bengal for *kharif* season.

MATERIALS AND METHODS

The experiment was conducted at the research farm of Uttar Banga Krishi Viswavidyalaya Pundibari, Cooch Behar, West Bengal during *kharif* season of two consecutive years, 2005 and 2006. The experiment was laid out in a split plot design with three replications keeping the date of transplanting in main plots and cultivar in sub-plots. The three date of transplanting and eight cultivar of rice belonging to high yielding, local scented and local non-scented groups were included in this experiment. Three date of transplanting were 14th July (D_1), 3rd August (D_2) and 23rd August (D_3) and eight cultivars were Mala (V_1), Swarna (V_2), Kathi tamali (V_3), Jaldhapa (V_4), Randhuni pagal (V_5), Hira (V_6), Gobinda bhog (V_7) and Satabdi (V_8). The seeds of each cultivar were sown in different beds, 28 days before transplanting. Twenty-eight days old seedlings of each cultivar were transplanted in 3 m x 5 m plots in main field at shallow depth (2-3 cm). A spacing of 15 cm x 20 cm was maintained in the plots with two seedlings per hill. Standard agronomic practices were followed with the recommended dose of fertilizers. Number of effective tillers per hill and grain yield was recorded plot wise and converted into t/ha. Data thus obtained were analyzed statistically.

RESULTS AND DISCUSSION

In respect of date of transplanting, during harvest, D_1 produced highest number of panicle (Table 1) bearing tillers (12.10) followed by D_2 (11.55) and D_3 (10.71). In case of cultivars, Kathi tamali produced highest number of tiller (10.86) during 30

Table 1. Tillering habit as well as yield of the rice cultivars in relation to date of transplanting (Mean of 2005 & 2006 July)

	Number of effective tillers per hill												Yield (t/ha)				
	30 DAT				60 DAT				At harvest								
Transplanting Date(s) / Cultivars	14th July	3rd August	23rd August	Mean	14th July	3rd August	23rd August	Mean	14th July	3rd August	23rd August	Mean	14th Jyly	3rd August	23rd August	Mean
Mala	10.97	10.10	9.37	**10.15**	13.90	13.37	12.50	**13.26**	12.77	12.30	11.80	**12.29**	2.56	1.92	1.34	**1.94**
Swarna	10.83	10.00	9.40	**10.08**	15.30	13.17	12.63	**13.70**	13.80	12.73	10.97	**12.50**	2.73	2.38	2.13	**2.41**
Kathi tamali	11.50	10.97	10.10	**10.86**	13.43	12.30	11.23	**12.32**	12.53	11.17	10.20	**11.30**	2.23	1.81	1.33	**1.79**
Jaldhapa	11.37	10.40	10.13	**10.63**	13.60	12.47	12.17	**12.75**	10.37	11.80	11.40	**11.19**	2.67	2.04	1.85	**2.19**
Ranndhuni pagal	11.70	10.03	9.90	**10.54**	13.70	12.53	11.60	**12.61**	13.07	11.73	10.36	**11.72**	1.80	1.63	1.27	**1.57**
Hira	8.83	8.50	8.23	**8.52**	11.87	11.17	10.57	**11.20**	11.33	10.77	9.83	**10.64**	1.79	1.14	1.01	**1.31**
Gobinda bhog	9.67	8.93	7.97	**8.86**	13.37	12.30	11.23	**12.30**	11.90	10.93	10.80	**11.21**	2.54	1.57	1.41	**1.84**
Satabdi	10.87	9.97	9.60	**10.15**	12.40	12.10	11.30	**11.93**	11.80	10.93	10.30	**11.01**	2.57	1.79	1.53	**1.96**
Mean	**10.72**	**9.86**	**9.34**		**13.45**	**12.43**	**11.65**		**12.20**	**11.55**	**10.71**		**2.36**	**1.79**	**1.48**	

	S.Em (±)	LSD (P = 0.05)	S.Em (±)	LSD (P = 0.05)	S.Em (±)	LSD (P = 0.05)	S Em (±)	LSD (P = 0.05)
Date of transplanting (DT)	**0.05**	**0.15**	**0.13**	**0.38**	**0.09**	**0.27**	**0.08**	**0.26**
Cultivar (C)	**0.06**	**0.19**	**0.11**	**0.39**	**0.11**	**0.33**	**0.10**	**0.32**
DT X C	**0.12**	**0.38**	**0.28**	**0.91**	**0.22**	**0.62**	**0.19**	**0.59**

DAS - Days after sowing, LSD - Least significant difference

DAT, where as cultivar Hira recorded lowest number of tillers (8.52). Swarna produced highest number of tillers (13.70) during 60 DAT and cultivar Hira produced lowest number of tillers (11.20). At harvest, there also found same result as like 60 DAT, Swarna and Hira produced highest (12.50) and lowest (10.64) number of panicle bearing tiller.

The highest grain yield (Table 1) was recorded in D_1 (2.36 t/ha) and was significantly superior to other dates of transplanting. This may due to the availability of more sunshine hours during the critical periods (Watanabe and Takeichi (1991), which ultimately had its pronounced effect on more number of productive tillers per hill. This is due to higher conversation of light energy into chemical energy and its subsequent translocation from source to sink in D_1 followed by D_2 and D_3. All the cultivars under different transplanting dates are taking more or less the same time to get maturity but Swarna produced highest yield in all the transplanting dates (2.73, 2.38 and 2.13 t/ha) which is significantly differed from others. The grain yield in short (Hira, 1.31 t/ha) and mid duration (Mala, 1.94 t/ha : Satabdi, 1.96 t/ha) varieties were lower than of long duration (Swarna, 2.41 t/ha) varieties, which may due to lesser number of productive tillers per m^2 number of field grains per panicle and test weight (Subbi Reedy, 2002).

All the interaction effects were significantly differed. Irrespective of cultivars rice grain yield decreased over 300 kg/ha for every 20 days delay in transplanting.

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