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EFFECTS OF DATES OF SOWING ON STEM BORER INFESTATION AND STERILITY IN TALL *INDICA* VARIETIES OF RICE DURING THE *BORO* SEASON

By

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The response of the three tall *indica* varieties of the rice viz. SR 26B, Latisail and Nagra *41*/14 to sowing dates of November 1, December 1 and January 1 during the *boro* season, have been studied interms of stem borer incidence, spikelet sterility and grain yield.

The results, in general, reveal minimum occurance of the pest and sterility in the plants of December 1 sowing and the maximum yield performance in those of November 1 sowing. Amongst the varieties, irrespective of date of sowing, the highest yield was obtained in Nagra 41/14, closely followed by Latisail but the minimum occurance of pest and sterility was recorded in Latisail and SR 26B, respectively. Irrespective ot the dates of sowing and varieties, there appear to remain an inverse relationship between yield and incidence of pest and sterility.

The results finally suggest that, perhaps, shifting of all the sowing time of the tall *indica* rices during the boro season to a date some where between November 1 and December 1, may prove beneficial in maximising the yield further by restricting the occurance of pest and sterility. This remains to be exactly ascertained.

INTRODUCTION

Contrary to the earlier belief, it is now well established that some of the photoperiod-sensitive tall *indica* rice varieties can be successfully grown during the

boro (dry) season (Das Gupta and Choudhury, 1978), It is noted that these varieties, when grown during the boro season, give much higher yield than in *kharif*, because of the prevalent conductive climatic conditions, especially the duration of sunshine hours. On the other hand, these varieties become valnerable to diseases and pests when grown in the normal *boro* season between November and May in a year. This may be assumed that the outturn from these varieties during the *boro* season would substantially increase under the prevalent favourable climatic conditions, provided the menace of diseases and pest is countered by any cultural manipulation. With this objective inview, the present investigation was taken up.

Materials and Methods

The experiment was conducted at the Experimental Research Farm of the University College of Agriculture, Calcutta University at Baruipur, 24-Parganas, during the *rabi* season of 1977-78 in a split plot design, having three replications, employing the rice cultivars, SR 26B, Latisail and Nagra 41/14. The seeds of the varieties were sown on the seed bed on the first day of November, December and January and the seedlings were correspondly transplanted after 45 days in each case. Nitrogen was applied in the form of ammonium sulphate in three equal split doses, the first during final land preparation, the second during peak tillering and the third during the flowering stage, at the rate of 60 kg/ha. Phosphorus and potassium were however, applied in a single dose at the rate of 40 kg/ha at the final land preparation in the forms of single superphosphate and muriate of potash, respectively.

At harvest, records were taken on stem borer incidence of the plant by following the method of Gomez (1972), and on sterility and grain yield, using the standard methods.

Results and Discussion

Evalution of the results clearly indicates a distinct role of time of sowing during the *boro* season on the susceptibility of the tall *indica* rices to stem borer attack (Table 1). Of the three dates of sowing, December 1 sowing appears to pro-

vide the most favourable conditions against stem borer incidence as compared to November and January sowing when the plants become vulnerable to the pest. Amongst the varietiese, Latisail appears to be more resistant to stem borer, closely followed by Nagra 41/14. Irrespective of the varieties, December sowing appears to be most favourable.

Table 1. *Stem border incidence (as per cent) in the rice cultivars grown under different dates of sowing*

Date of sowing	Variety			Mean
	SR 26B	Latisail	Nagra 41/14	
November 1	20.24	1.39	0.85	7.49
December 1	3.19	0.50	1.20	1.63
January 1	7.14	9.57	13·08	9.93
Mean	10.19	3·76	5.04	

C. D. at 0.01 P :
Variety : 3.90
Date of sowlng : 5.42
Variety x Date of sowing : 9.39

Grain sterility also differed significantly with date of sowing and varieties (Table 2). As noted in case of stem borer incidence, grain sterility also occurs minimum in December sowing and maximum in January sowing. This may indicate that much of the grain sterility might have occur due to attack by stem borer at the flowering stage, or this may suggest the set of environmental factors which induces the onslought of stem borer on the plants also, in some way or other responsible in imparting sterility to the grains. It is however, noted that the relative difference amongst the varieties is some what altered in respect of grain sterility as compared to that observed in stem borer incidence. It is noted that SR 26B, at the minimum grain sterility as against maximum in Nagra 41/14. The results may indicate the differential response of the varieties to various external factors due to inherent characteristic genetic make up.

Table 2. *Grain sterility (as per cent) in the rice cultivars grown under different dates of sowing*

Date of sowing	Variety			Mean
	SR 26B	Latisail	Nagra41/14	
November 1	6.67	12.89	9.40	9.64
December 1	5.35	6.48	8.52	6.79
January 1	32.72	39.39	49.19	40.40
Mean	14.91	19.60	22.37	

C. D. at 0.01 P,
Variety : 1. 94
Dats of sowrng : 0.56
Variety x Date of sowing : 0.98

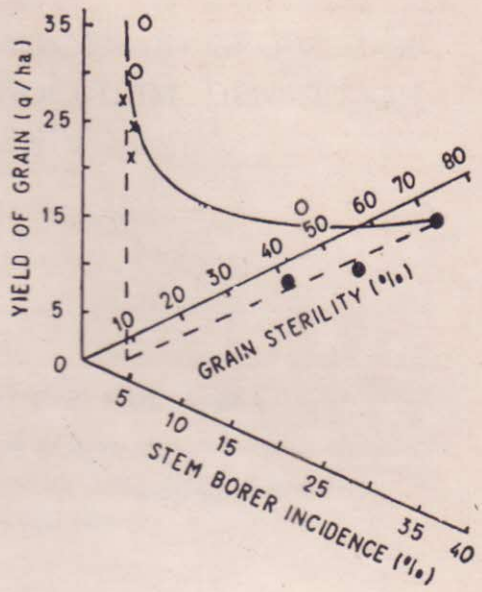
The data on grain yield, as affected by the date of sowing and variety are however, reflect a different picture from what has been noted in respect of stem borer incidence and sterility of grain (Table 3). Although minimum loss due to stem borer attack and sterility of grains is attained on December sowing, maximum yield is recorded in November sowing and minimum in January sowing. While the poor performance of January sowing may be attributed to the prevalent unfavourable climatic conditions that induce stem borer incidence and sterility, the favourable response of the plants to November sowing may be the results in effect of the low temperature and other favourable climatic factors which the plant received during the early phases of its growth. Nagai (1958) also reported that the *indica* varieties require low temperature and more hours of bright sunshine during tillering.

Table 3. *Grain yield (g/ha) of the rice cultivars grown under different dates of sowing*

Date of sowing	Variety			Mean
	SR 26 B	Latisail	Nagra41/14	
November 1	23.26	31.85	28.14	27.75
December 1	20.89	26.06	23.10	23.35
January 1	3,20	3.73	15.25	7.39
Mean	15.73	20.54	22.16	

C. D. at 0.01 P;
Variety : 2.53
Date of sowing : 1.69
Variety x Date of sowing : 2.94

While comparing the response of the varieties in respect of yield performances irrespective of the date of sowing against grain sterility and stem borer incidence, it appears that the latter two are inversely related with the former, that is, the grain yield increases as the grain sterility and stem borer incidence decrease and *vice versa* (Text fig. 1). In short, the results suggest that the the sowing of the plants in the *boro* season sometimes at a mid way between November 1 and December 1 may proved to be effective in avoiding stem borer incidence and grain sterility to great extent and giving an optimum yield. This needs to be examine further.



Text fig. 1. Relationship amongst grain yield, grain sterility and stem borer incidence in tall *indica* rice grown under varying dates of sowing in *boro* season.

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