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## Relative Susceptibility of Some Wheat Lines to the Pink Borer, *Sesamia inferens* Walker (Lepidoptera: Noctuidae) on Wheat

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**Abstract:** A field experiment was conducted to study the susceptibility of pink borer, *Sesamia inferens* Walker on different wheat lines during 1992-93 at Wheat Research Center, Dinajpur, Bangladesh. The susceptibility of pink borer was recorded only at heading or panicle initiation stage of wheat crops. The lines BAW-743 and BAW 769 of the 28 tested lines were found promising to pink borer tolerance and yield.

**Key words:** Susceptibility, wheat lines, *Sesamia inferens*

### Introduction

Wheat (*Triticum aestivum*) is the leading cereal crop of the world. It ranks first according to acreage of cultivation and production among the grain crops of the world (Walton, 1969; FAO, 1988). In Bangladesh, wheat occupies the second position as grain crops, next to rice and in 1995-96 it occupied an area of 701.39 thousand hectare with total production of 1369.13 thousands tons (BBS, 1997). Pink borer, *Sesamia inferens* Walker, a polyphagous insect pest, causes major damage by feeding inside the stem showing dead hearts at tillering stage and empty white heads at ripening stage and ultimately reducing the yield by more than 11% in India and Bangladesh (Saxena *et al.*, 1972 and Ahad *et al.*, 1994, 1995).

Control of this pest by insecticides may cause several problems in agroecosystem. To overcome adverse effects of chemical insecticides, researchers now have drawn their attention to develop resistant varieties against insect pests. A number of resistant varieties of different crops against different insect pests have already been developed. Several rice varieties resistant to stem borer complex inducing pink borer have also been developed (Catling *et al.*, 1977). The present study was under taken to find the tolerant wheat lines against this insect pest on the basis of borer infestations.

### Materials and Methods

A field experiment was conducted in the Wheat Research Center Farm, Dinajpur, Bangladesh during 1992-93 with 28 wheat lines: BAW-728, BAW-733, BAW-735, BAW-736, BAW-737, BAW-743, BAW-744, BAW-748, BAW-750, BAW-755, BAW-756, BAW-761, BAW-762, BAW-769, BAW-771, BAW-772, BAW-773, BAW-774, BAW-776, BAW-777, BAW-778, BAW-780, BAW-781, BAW-785, BAW-789, BAW-790, BAW-794 and BAW-795. The cultivated variety Kanchan was used as a check. The experiment was laid out in Randomized Complete Block Design (RCBD) having plot size of 5X2 m<sup>2</sup> and plot to plot distance was 60cm. Wheat seeds were sown @ 10 lines plot<sup>-1</sup>, the distances between rows were 20 and 5cm within the rows. Fertilizers were applied at the rate of 222 kg urea (100 kg N<sub>2</sub>), 135 kg TSP (60 kg P<sub>2</sub>O<sub>5</sub>), 67.6 kg MP (40 kg K<sub>2</sub>O) and 110 kg gypsum (20 kg) per hectare. During experimental period pesticides were not applied and necessary intercultural operations were done.

Pink borer infestation rates were assessed by weekly counting of dead hearts and/or white heads in each plot. Observations started from 15 days after seed sowing and continued upto three months. The data on infestation and yield of tested wheat lines were analyzed statistically and mean differences were separated by Duncan's Multiple Range Test (Duncan, 1951). The percentage data were transformed by square root transformation before statistical analysis.

### Results and Discussions

The susceptibility of pink borer on different wheat lines based on the percentage of pink borer infestation has been shown in

Table 1: Incidence of pink borer on different wheat lines and yield

Lines/variety	% Incidence of pink borer	Mean yield	
		gm plot <sup>-1</sup>	Kg ha <sup>-1</sup>
BAW-728	8.74ab	1973.17gh	2466.45
BAW-733	5.83bcde	2472.27abcd	3000.33
BAW-735	3.84defgh	2027.70fgh	2534.66
BAW-736	5.10bcdef	2250.10cdefgh	2812.66
BAW-737	3.99defgh	2444.50abcde	3055.62
BAW-743	1.10l	2055.46efgh	2569.33
BAW-744	5.75bcdef	1611.20h	2014.00
BAW-748	2.95efghi	2528.00abc	3160.00
BAW-750	6.93bcd	1763.20h	2204.00
BAW-755	11.88a	2111.20defgh	2639.00
BAW-756	5.25bcdef	2777.86abc	3472.33
BAW-761	2.89efgi	2583.13abc	3228.92
BAW-762	1.78hi	2389.06bcdef	2986.33
BAW-769	1.42l	2555.73abc	3194.66
BAW-771	4.58bcdef	2805.60a	3507.00
BAW-772	5.59bcdef	2194.40cdefg	2743.00
BAW-773	4.82bcdef	2444.53abcde	3055.66
BAW-774	5.66bcdef	2291.73cdefg	2864.16
BAW-776	7.49abc	2277.86cdefg	2847.33
BAW-777	2.73fghi	2250.13cdefg	2812.66
BAW-778	2.37cdefg	2222.40cdefg	2778.00
BAW-780	1.78ghi	2305.00cdefg	2882.00
BAW-781	1.51hi	2180.00cdefg	2726.00
BAW-785	3.96defgh	2277.86cdefg	2847.33
BAW-789	5.09bcdef	2333.60cdefg	2917.00
BAW-790	1.65hi	2500.26abcd	3125.33
BAW-794	1.97ghi	2333.60cdefg	2917.00
BAW-795	3.25efghi	2472.27abcd	3090.33
Kanchan	1.44l	2347.00cdefg	2986.00

Means within column followed by the same letter(s) did not differ significantly by DMRT at P > 0.01

Table 1. During experiment, symptoms of dead heart were not observed in the fields. The infestation rates of pink borer as white head varied significantly among the 28 tested wheat lines (P < 0.01). The lowest incidence (1.10%) of pink borer, was observed in the line BAW-743 and the highest (11.88%) in BAW-755.

Among the 28 tested wheat lines, 9 lines such as BAW-743, BAW-769, BAW-781, BAW-790, BAW-780, BAW-794, BAW-777, BAW-748, BAW-795 and check variety Kanchan were statistically identical least preferred or least infestation group and the percentages of infestation were 1.14 to 3.25, where as 3 lines such as BAW-776, BAW-728, BAW-755 were the most susceptible or highest infestation group and the percentages of infestation were 7.49, 8.74, and 11.80 respectively. Nine wheat lines such as BAW-771, BAW-773, BAW-789, BAW-736, BAW-756, BAW-772, BAW-774, BAW-744 and BAW-733 were of moderate incidence or

susceptible group and the percentages of incidence were 4.58 to 5.83.

Significant difference ( $P = 0.001$ ) in the yield of different wheat lines was observed (Table 1). The highest yield ( $3507.00 \text{ kg ha}^{-1}$ ) was recorded in the line BAW-771, which was statistically identical with 7 wheat lines such as BAW-737, BAW-733, BAW-795, BAW-790, BAW-748, BAW-769 and BAW-761 and the yield were  $3055.62$  to  $3507.00 \text{ kg ha}^{-1}$ . There were 6 low yielding lines such as BAW-744, BAW-750, BAW-728, BAW-735, BAW-736 and BAW-755 and the yield were  $2204.00$  to  $2639.00 \text{ kg ha}^{-1}$ . The moderate yielding group were 9 lines such as BAW-781, BAW-778, BAW-777, BAW-785, BAW-776, BAW-774, BAW-780, BAW-789, BAW-794 and check variety Kanchan and the yields were  $2726.00$  to  $2986.00 \text{ kg ha}^{-1}$ .

The observation also indicated that pink borer infested the wheat field only in the heading or panicle initiation stage of plants, exhibiting white head symptoms. This might be correlated with the seasonal abundance of insect pest. About similar results were also obtained by Ahad *et al.* (1994, 1995) and reported that the pink borer infested wheat field only at the later stage of plants exhibiting white head symptoms. Garg (1988) reported that the larvae of this pest remained dormant in winter, hibernate in rice stubbles and infested the wheat crops at later stage.

The results indicate that the lowest susceptibility was found in the line BAW-743 and BAW-769. But the yield of BAW-769 was greater than the check variety, Kanchan and yield of BAW-743 is also statistically identical to it. So, these two lines may be introduced.

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