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Evaluation of different rice genotype against yellow stem borer (*Scirpophaga incertulas* Walker)

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Abstract
The experiment was conducted in the consecutive two years 2016 and 2017 in the field conditions. As such, based on the overall mean values of two years' of investigations, the least percentage of dead-heart (1.87%) was recorded in case of Suraksha, followed by Kavya (4.50%), Lalat (5.59%), CR Dhan – 303 (5.94%), CR Dhan – 205 (6.77%), Sahbhagi Dhan (6.88%), CR Dhan – 304 (7.02%) and Naveen (7.27%). These rice cultures were rated as promising and resistant against dead heart incidence, caused by YSB. The susceptible rice variety, TN-1 received the highest dead-heart amounting to 19.70 percent in the present studies based overall mean of two years' results. As such, based on the overall mean values of WE recorded during two years' investigations, the least percentage of white ear (3.16%) was noticed in case of Suraksha which remained at par with Kavya (4.34%), Akshay Dhan (3.46%), IR-20 (4.36%), IR-36 (4.50%), IR-64 sub-1 (4.64%) and followed by CR Dhan- 304 (5.27%) CR Dhan – 303 (5.78%), Lalat (6.66%) and Sahbhagi Dhan (9.63%) and all these rice genotypes received below 10 per cent white ear, caused by the stem borer, as against the highest incidence of WE was observed in the susceptible variety, TN-1 (22.71%) in the present studies. The test genotype could be arranged in descending order of**:** Ac Dhan (61.15 q/ha) > Advanta-801^{+} (59.30 q/ha) > CR Dhan -205 (52.58 q/ha) > CR Dhan – 303 (51.16 q/ha) > Lalat (50.95 q/ha) > IR-36 (50.34 q/ha) > Abhisek (49.78 q/ha) in terms of grains yield and all these seven genotype remained statistically at par. TN-1 appeared as susceptible to yellow stem borer.

Keywords: Variety, pest, dead heart, white ear, yellow stem borer, resistant

Introduction
Rice (*Oryza sativa* L.) is the staple food for over half the world's population. It is distributed all over the world with a high concentration in Asia and it's provides 27 per cent of dietary energy and 20 per cent of dietary protein in the developing country. As the area under cultivation is gradually being decreased and demand for enhanced production is increasing, emphasis is being given towards intensification through higher inputs and cropping intensity. Such efforts, in turn, increase pest intensities [1] and losses caused by pests remains an important constraint for achieving higher paddy yields. Out of one dozen insect pest species prevailing in rice agro - ecosystem in the state of Jharkhand, half of a dozen of them are considered as major insect pests which are responsible for causing loss in yield ranging from 20-35 percent in general in the state [2, 3]. Among the various biotic factors responsible for lowering down the yield of the rice in the state of Jharkhand attack of yellow stem borer (*Scirpophaga incertulas* Walker) is one of them which could cause loss in yield from 10-30% [4, 5]. Host plant resistance is a connection between the phytophagous insects and their host plants [6]. Plant resistance enables plants to keep away from, tolerate or recover from the damage of insect's attack and has unfold to be a successful tool against insects in many crops [7]. Plant genotype, either due to environmental stress or genetic makeup, possess physiological and biochemical differences which alter the nutritional value for phytophagous insects [8]. In some cases, the combined primary metabolites and secondary metabolites either get better the quality of the host plant as a source of food and can therefore be considered positive to herbivorous insects or make the superiority of host plant as source of food unfavorable to phytophagous insects [9]. Use of HPR is not only environment friendly but also it is cost effective. Resource of poor farmers cannot afford the expenses incurred on the insecticidal inputs to protect their crop.

They need pest resistant or tolerant rice genotype to realize better and higher yield of grains, without minimum or no pesticidal application for sustainable rice production. Use of resistant genotype of rice is highly feasible for eco-friendly management of rice pests. The experiment was conducted in the consecutive two years' 2016 and 2017 in the field conditions. Therefore, attempts were made to use of HPR for identification of resistant/tolerant rice genotype will help to reduce/minimize the yield loss for sustainable production of rice for ensuring food security.

Methods and Materials

The experiment to evaluate certain rice genotype for their relative resistance against yellow stem borer was conducted at the rice research farm, B.A.U, Kanke Ranchi, Jharkhand during *Kharif* 2016 and 2017, the brief description of which is given, here, as under:

Detail of the field experiment, conducted during *Kharif* 2016 and 2017

Design Rice genotype	: :	RBD (Randomized block design) 20
Replications	:	3
Spacing (plant to plant)	:	15 cm
Spacing (row to row)	:	20 cm
Plot size	:	5 x 4 m
N:P: K	:	80:40:20 kg/ha (As per local recommendation)
Date of Sowing	:	5th July
Date of Transplanting	:	24th July
Date of harvesting	:	9th November

Table 1: List of rice genotype proposed for their field screening for their relative resistance against major insect pests of rice

Sl. No.	Genotype	SL. No.	Genotype
1	CR Dhan – 303	11	Akshay Dhan
2	IR-20	12	IR-64 Sub-1
3	MTU- 1010	13	CR Dhan -205
4	IR-64Drt.	14	DRR-44
5	Naveen	15	BVS-1
6	Sahbhagi Dhan	16	Kavya
7	Pusa- 1176	17	Lalat
8	Abhishek	18	Advanta-801+
9	IR-36	19	Suraksha (RC)
10	CR Dhan – 304	20	TN-1 (SC)

Result and Discussion

Twenty common rice genotypes were tested for two consecutive years', 2016 and 2017 in *Kharif* against yellow stem borer (YSB) in the vegetative and reproductive stage of the crop. At the vegetative stage the larvae of the pest caused dead heart (DH) and at the reproductive stage of the crop, the same could be able to cause white ear (WE).

(i.) Dead-heart (DH)

It was general observation that relatively lesser quantum of the incidence of the pest, in terms of dead hearts, was noticed during 2nd year as compared to that of 1st year of the experimentation, recorded at 30 and 45 DAT.

It was noteworthy to mention that the dead heart, ranged from 1.82 to 20.72 per cent and that of 1.67 to 18.18 per cent during 2016 and 2017, respectively at 30 DAT. The dead heart incidence ranged from 2.32 to 22.35 per cent and 1.67 to 17.55 per cent during 2016 and 2017, respectably of 45 DAT. As such, the intensity of the pest was founded to be increased with the advancement of growth stage and age of the crop from 30 to 45 DAT. It was found that there were significant differences among the test rice genotypes in terms of extent of incidence of dead hearts, recorded at 30 and 45 DAT during both of the years' of the experimentations. The mean incidence of the pest of the two years' recorded in the test rice genotypes also differed significantly and overall mean incidence of the pest followed almost similar trends (Table 02).

The experimental results (Table 02) revealed the lowest intensity of dead heart was found in case of Suraksha, amounting to the tune of 1.82, 1.67 and 2.32, 1.67 per cent at 30 and 45 DAT recorded during 2016 and 2017, respectively. The next best rice genotype was Kavya which also received significantly lower incidence of dead heart to the tune of 4.58, 3.57 and 5.67, 4.23 per cent at 30 and 45 DAT recorded during 2016 and 2017 respectively. The rice genotypes viz CR Dhan -303, CR Dhan- 304, Naveen, Lalat, CR Dhan – 205 and Sahbhagi Dhan remained almost at par with Kavya in terms of lower incidence of dead heart at 30 and 45 DAT, during both of the years of experimentations. The mean values of dead hearts computed from two years' data, recorded at 30 and 45 DAT and that of the overall mean values of the two years of all the observations followed almost similar trends. The highest incidence of dead heart to the tune of 20.72, 18.18 and 22.35, 17.55 per cent was registered in case of the susceptible variety, TN-1 at 30 and 45 DAT recorded during, 2016 and 2017, respectively.

As such, based on the overall mean values of two years' of investigations, the least percentage of dead heart (1.87%) was recorded in case of Suraksha, followed by Kavya (4.50%), Lalat (5.59%), CR Dhan – 303 (5.94%), CR Dhan – 205 (6.77%), Sahbhagi Dhan (6.88%), CR Dhan – 304 (7.02%) and Naveen (7.27%). These rice cultures were rated as promising and resistant against dead heart incidence, caused by YSB. The susceptible rice variety, TN-1 received the highest dead heart amounting to 19.70 per cent in the present studies based overall mean of two years' results.

Earlier, also found that rice genotype Suraksha, Lalat and BG-380-2 remained moderately resistant to YSB and Pusa Basmati-1 and Jaya were susceptible to the same pest spp. in terms of dead heart incidence [10]. As such, the findings of the previous scientist[10] are in consonance with the results of the present investigations.

(ii.) White ear (WE)

The results (Table 03) indicated that relatively higher incidence of white ear, caused by YSB, was observed during 2017 as compared to those of 2016 both at dough and pre-harvest stages of the crop almost in all the test rice genotypes, just in reverse of dead heart incidence. Almost similar trends of incidence of white ear were registered in case of mean of the two observations obtained at dough and the maturity stage of the crop, recorded during 2016 and 2017.

It was noteworthy to mention here that the white ear ranged from 2.34 to 19.45 per cent and that of 2.80 to 22.59 per cent during 2016 and 2017, respectively at dough stage of the crop. The white ear incidence varied from 3.44 to 23.45 per cent and 4.07 to 25.37 per cent during, 2016 and 2017, respectively at the pre-harvest stage of the crop. As such, the intensity of the pest incidence was found to be enhanced with advancement of the age of the crop, i.e. from dough to the maturity stage of the crop. It was found that there were significant differences among the test rice genotypes in terms

of extent of incidence of white ear, recorded at dough and pre-harvest stages of the crop during both the years of field investigations. The mean incidence of the pest species, in terms of white ear, of the two years', recorded in the test rice genotypes also differed significantly and overall mean incidence of the pest followed almost similar trends (Table 03).

The experimental findings (Table 03) revealed that the significantly lowest intensity of white ear was found in case of Suraksha amounting to the tune of 2.34, 2.80 and 3.44, 4.07 per cent at dough and pre-harvest stages of the crop during 2016 and 2017, respectively. Akshay Dhan, IR-36, CR Dhan – 304, Kavya, CR Dhan-303, IR 64 sub-1 and IR 20 remained almost at par with Suraksha in terms of incidence of white ear, recorded at dough and pre-harvest stages of the crop during, 2016 and 2017 (Table 03). The mean values of white ear of 2016 and 2017 recorded at the both stages and that of the overall mean of two years' followed almost similar trends. The rice genotype viz. Lalat, DRR-44, PUSA-1176 and Sahbhagi Dhan also received almost considerably lower incidence of white year, below 10 per cent. The highest incidence of white ear was recorded in case of the susceptible variety, TN-1 during both of the years' of the present field investigations at dough and pre-harvest stages of crop. The mean values of WE of 2016 and 2017, separately and that of overall mean of the both years', recorded in, TN-1 followed almost similar trends.

As such, based on the overall mean values of WE recorded during two years' investigations, the least per centage of white ear (3.16%) was noticed in case of Suraksha which remained at par with Kavya (4.34%), Akshay Dhan (3.46%), IR-20 (4.36%), IR-36 (4.50%), IR 64 sub-1 (4.64%) and followed by CR Dhan- 304 (5.27%) CR Dhan – 303 (5.78%), Lalat (6.66%) and Sahbhagi Dhan (9.63%) and all these rice genotypes received below 10 per cent white ear, caused by the stem borer, as against the highest incidence of WE was observed in the susceptible variety, TN-1 (22.71%) in the present studies. Previously reported that rice entries viz. SKL-7-61-9-10-12 and BG-380-2 suffered from the lowest incidence of YSB whereas JGL-3855, DJP-1998-11-1-1 and Birsa Mati harboured higher incidence of YSB[11]. Findings of Scientists also endorsed the results of the present investigation referring Suraksha, Kavya, Akshay Dhan, IR-20 and IR-36, IR-64 sub-1 emerged as promising and resistant (ie. <5% WE) against WE and those of CR Dhan-304, CR Dhan- 303, Lalat and Sahbhagi Dhan were rated as promising and moderately resistant (<10%WE) to WE, caused by YSB [10].

Earlier also reported that the pest tolerant/resistant genotype viz. Lalat, IR-36 and Naveen received significantly lower incidence of dead heart as compared to those of the pest susceptible genotype viz. IR-64, Brisa Mati, PAC-801, PAC-807 and TN-1 [12].

As such, based on the overall mean findings of the present investigations, it may be concluded that rice genotypes viz. Suraksha, Kavya, Lalat, CR Dhan-303, CR Dhan-205, Sahbhagi Dhan, CR Dhan-304, and Naveen could be considered as promising and resistant against dead heart incidence, due to YSB and Surakha, Kavya, IR-20, IR-36, IR-Sub-1, CR Dhan- 303, CR Dhan-304, Lalat and Sahbhagi Dhan proved to be promising and resistant against incidence of white ear caused YSB.

Yield of rice grains of some rice genotype

The results on grains' yields were recorded during kharif 2016 and 2017, after harvest of the crop at attainment of maturity of the crop, in terms of kg per plot and then it was converted into q/ha. The mean yields of grains of two years' were also calculated for drawing the overall conclusion. The result is presented Table 04.

A perusal of results revealed that the significantly highest grains yields of 60.47 and 61.83 q/ha with the mean yield of two years' (61.15q/ha) was realized from the rice variety, Akshay Dhan which, in turn, remained at par with Advanta 801^{+} yielding 58.57 and 60.03 q/ha during, 2016 and 2017, respectively with the higher mean yield of 59.30 q/ha followed by CR Dhan-205, CR Dhan - 303, Lalat, IR-36, Abhishek and MTU-1010, as against the lowest yield of 21.03 and 22.43 q/ha recorded during 2016 and 2017 with minimum mean yield of 21.73 q/ha in the present studies in case of the susceptible rice variety, TN-1.

It is an established fact that the yield realizing capacity of any genotype or variety of any crop is regulated not only by its own genetic yield potentiality as well as their resistance and tolerance ability against the prevailing biotic and abiotic factors of the environment but also by the optimal inputs supplied to the plants by the growers under the given set of congenial agro-ecological situations. It is not always possible and feasible that the pest resistant variety will always be higher yielder because the yield potentiality may also be relatively lower despite the desirable quantum of tolerance or resistance ability against the given set of biotic and abiotic factors. If any variety could be able to realize higher grains-yield in spite of higher degree of attack of the pest then in that case, the variety will said to be tolerant to that YSB pest species. In the present studies, Akshay Dhan, Advanta 801^{+}, Abhishek, CR Dhan-205 and MTU-1010 could be able to realized relatively higher grains yield to the tune of 61.15, 59.30 49.78, 52.58 and 48.24 q/ha in spite of suffering from relatively higher incidence of YSB. As such the results showed that these genotypes remained tolerant to these pest species in the present studies.

Table 2: Relative incidence of yellow stem borer (*Scirpophaga incertulas* Walker) in some rice genotypes in terms of dead heart (DH%)

		Percentage of dead heart (DH) caused by YSB, recorded at								
	Genotype	DH% AT 30 DAT			DH% AT 45 DAT			Overall Mean		
SN.		2016	2017	Pooled Mean	2016	2017	Pooled Mean	2016	2017	Pooled Mean
T1	CR Dhan - 303	5.42 (13.23)	4.61 (12.25)	5.02 (12.74)	6.51 (14.33)	7.22 (15.13)	6.87 (14.73)	5.97 (13.80)	5.92 (13.78)	5.94 (13.79)
T2	IR-20	18.60 (25.21)	16.37 (23.76)	17.49 (24.48)	20.63 (26.74)	18.34 (25.21)	19.49 (25.97)	19.62 (25.99)	17.36 (24.51)	18.49 (25.25)
T3	MTU- 1010	10.59 (18.91)	8.50 (16.70)	9.55 (17.81)	12.42 (20.45)	10.33 (18.35)	11.38 (19.40)	11.50 (19.72)	9.42 (17.60)	10.46 (18.66)
T4	IR-64 Drt.	8.43 (16.52)	9.75 (17.91)	9.09 (17.22)	10.43 (18.28)	11.72 (19.95)	11.07 (18.91)	9.43 (17.42)	10.73 (18.75)	10.08 (18.09)
T5	Naveen	7.58	5.59	6.59	8.61	7.29	7.95	8.09	6.44	7.27

		(15.84)	(13.47)	(14.65)	(16.84)	(15.26)	(16.05)	(16.48)	(14.40)	(15.44)
T6	Sahbhagi	6.40 (14.50)	5.88 (13.76)	6.14 (14.13)	7.75 (15.98)	7.48 (15.41)	7.62 (15.69)	7.08 (15.28)	6.68 (14.61)	6.88 (14.94)
T7	Pusa- 1176	13.40 (21.12)	10.26 (18.44)	11.83 (19.78)	16.37 (23.52)	12.29 (20.34)	14.33 (21.93)	14.88 (22.35)	11.28 (19.41)	13.08 (20.88)
T8	Abhisek	10.37 (18.65)	9.77 (17.98)	10.07 (18.31)	13.25 (20.99)	11.44 (19.53)	12.34 (20.26)	11.81 (19.86)	10.60 (18.77)	11.21 (19.31)
T9	IR-36	11.59 (19.52)	9.86 (17.95)	10.73 (18.73)	13.16 (21.11)	9.39 (17.57)	11.28 (19.34)	12.37 (20.34)	9.63 (17.76)	11.00 (19.05)
T10	CR Dhan - 304	6.43 (14.53)	5.83 (13.74)	6.13 (14.14)	8.36 (16.51)	7.46 (15.44)	7.91 (15.97)	7.40 (15.59)	6.65 (14.62)	7.02 (15.10)
T11	Achhay Dhan	9.32 (17.55)	7.68 (15.94)	8.50 (16.74)	12.35 (20.42)	9.39 (17.52)	10.87 (18.97)	10.84 (19.08)	8.54 (16.79)	9.69 (17.93)
T12	IR-64 Sub-1	10.80 (18.88)	8.95 (17.16)	9.87 (18.02)	11.40 (19.55)	8.53 (16.80)	9.97 (18.17)	11.10 (19.23)	8.74 (16.98)	9.92 (18.10)
T13	CR Dhan -205	6.79 (14.77)	5.51 (13.15)	6.15 (13.96)	8.29 (16.41)	6.49 (14.17)	7.39 (15.29)	7.54 (15.66)	6.00 (13.68)	6.77 (14.67)
T14	DRR-44	13.59 (21.50)	12.60 (20.62)	13.10 (21.06)	15.53 (22.95)	14.66 (22.44)	15.10 (22.70)	14.56 (22.27)	13.63 (21.55)	14.10 (21.91)
T15	BVS-1	9.17 (17.33)	7.50 (15.60)	8.33 (16.46)	11.20 (19.21)	7.16 (15.42)	9.18 (17.32)	10.18 (18.29)	7.33 (15.52)	8.76 (16.91)
T16	Kavya	4.58 (12.11)	3.57 (10.65)	4.07 (11.38)	5.61 (13.28)	4.23 (11.54)	4.92 (12.41)	5.10 (12.75)	3.90 (11.15)	4.50 (11.95)
T17	Lalat	5.81 (13.81)	4.31 (11.76)	5.06 (12.78)	6.81 (14.88)	5.41 (13.08)	6.11 (13.98)	6.31 (14.39)	4.86 (12.65)	5.59 (13.52)
T18	Advanta-801+	13.70 (21.38)	10.66 (18.88)	12.18 (20.13)	15.00 (22.63)	11.36 (19.47)	13.18 (21.05)	14.35 (22.03)	11.01 (19.21)	12.68 (20.62)
T19	Suraksha	1.82 (7.60)	1.67 (7.27)	1.75 (7.44)	2.32 (8.69)	1.67 (7.27)	2.00 (7.98)	2.07 (8.18)	1.67 (7.27)	1.87 (7.73)
T20	TN-1	20.72 (26.64)	18.18 (25.16)	19.45 (25.90)	22.35 (28.11)	17.55 (24.72)	19.95 (26.41)	21.54 (27.42)	17.87 (24.94)	19.70 (26.18)
	SEm±	(1.52)	(1.45)	(0.96)	(1.42)	(1.49)	(0.97)	(1.24)	(1.34)	(0.85)
	CD 5%	(4.34)	(4.14)	(2.69)	(4.07)	(4.25)	(2.72)	(3.54)	(3.85)	(2.39)
	CV%	(15.01)	(15.57)	(15.28)	(12.95)	(14.95)	(13.90)	(11.70)	(13.94)	(12.78)

Figures under the parenthesis are angular transformed values. DAT-Days after transplanting; DH- dead heart.

Table 3: Relative incidence of yellow stem borer (*Scirpophaga incertulas* Walker) in some rice genotypes in terms of white ear (WE%)
Figures under the parenthesis are angular transformed values. WE- white ear

		Percentage of white ear (WE) Caused by YSB, recorded at								
	Genotype	**WE% AT Dough Stage**			**WE% AT Pre-Harvest Stage**			**Overall Mean**		
SN.		**2016**	**2017**	**Pooled Mean**	**2016**	**2017**	**Pooled Mean**	**2016**	**2017**	**Pooled Mean**
T1	CR Dhan - 303	4.85 (12.46)	5.06 (12.52)	4.96 (12.49)	5.73 (13.43)	7.47 (15.29)	6.60 (14.36)	5.29 (12.96)	6.27 (13.97)	5.78 (13.46)
T2	IR-20	3.19 (9.91)	4.18 (11.54)	3.69 (10.73)	4.48 (11.57)	5.60 (13.18)	5.04 (12.37)	3.84 (10.78)	4.89 (12.39)	4.36 (11.59)
T3	MTU- 1010	6.51 (14.50	7.24 (14.86)	6.87 (14.68)	7.47 (15.46)	8.80 (16.85)	8.14 (16.15)	6.99 (14.99)	8.02 (15.91)	7.51 (15.45)
T4	IR-64 Drt.	8.44 (16.51)	10.26 (18.11)	9.35 (17.31)	9.35 (17.33)	12.40 (20.19)	10.87 (18.76)	8.89 (16.93)	11.33 (19.25)	10.11 (18.09)
T5	Naveen	10.52 (18.35)	11.48 (19.61)	11 (18.98)	12.50 (20.65)	11.83 (20.00)	12.16 (20.32)	11.51 (19.61)	11.66 (19.81)	11.58 (19.71)
T6	Sahbhagi	8.42 (16.35)	9.39 (17.44)	8.91 (16.89	9.32 (17.64)	11.37 (19.27)	10.35 (18.45)	8.87 (17.04)	10.38 (18.44)	9.63 (17.74)
T7	Pusa- 1176	7.59 (15.32)	7.85 (15.71)	7.72 (15.51)	8.76 (16.88)	9.25 (17.38)	9.01 (17.13)	8.18 (16.22)	8.55 (16.58)	8.36 (16.40)
T8	Abhisek	11.68 (19.28)	13.60 (21.36)	12.64 (20.32)	12.41 (20.06)	16.11 (23.20)	14.26 (21.63)	12.04 (19.68)	14.86 (22.35)	13.45 (21.01)
T9	IR-36	3.30 (10.11)	4.18 (11.51)	3.74 (10.81)	4.43 (11.56)	6.10 (13.67)	5.27 (12.62)	3.87 (10.92)	5.14 (12.64)	4.50 (11.78)
T10	CR Dhan - 304	4.50 (12.09	5.54 (13.30)	5.02 (12.70)	4.87 (12.44)	6.18 (14.01)	5.52 (13.22)	4.69 (12.27)	5.86 (13.66)	5.27 (12.97)
T11	Achhay Dhan	3.04 (9.66)	3.28 (10.13)	3.16 (9.90)	3.72 (10.48)	3.79 (10.83)	3.76 (10.65)	3.38 (10.46)	3.53 (10.49)	3.46 (10.47)
T12	IR-64 Sub-1	4.02 (11.31)	4.63 (12.17)	4.33 (11.74)	4.16 (11.52)	5.75 (13.70)	4.96 (12.61)	4.09 (11.47)	5.19 (12.96)	4.64 (12.21)
T13	CR Dhan -205	10.59 (18.42)	12.28 (20.36)	11.43 (19.39)	11.63 (19.47)	14.37 (21.99)	13.00 (20.73)	11.11 (18.95)	13.32 (21.23)	12.22 (20.09)
T14	DRR-44	7.76 (15.74)	8.54 (16.83)	8.15 (16.29)	8.63 (16.73)	9.35 (17.16)	8.99 (16.95)	8.19 (16.25)	8.95 (17.04)	8.57 (16.64)

T15	BVS-1	14.58 (21.92)	15.60 (22.90)	15.09 (22.41)	15.51 (22.85)	16.75 (23.72)	16.13 (23.28)	15.04 (22.40)	16.18 (23.39)	15.61 (22.89)
T16	Kavya	3.60 (10.73)	4.41 (11.64)	4.01 (11.18)	4.44 (11.77)	4.92 (12.30)	4.68 (12.03)	4.02 (11.27)	4.67 (11.97)	4.34 (11.62)
T17	Lalat	5.62 (13.43)	6.77 (14.84)	6.20 (14.13)	6.66 (14.52)	7.57 (15.60)	7.11 (15.06)	6.14 (13.99)	7.17 (15.23)	6.66 (14.61)
T18	Advanta-801+	7.63 (15.54)	9.27 (17.42)	8.45 (16.48)	8.16 (16.26)	8.40 (16.50)	8.28 (16.38)	7.90 (15.97)	8.84 (17.04)	8.37 (16.51)
T19	Suraksha	2.34 (8.68)	2.80 (9.35)	2.57 (9.01)	3.44 (10.34)	4.07 (11.26)	3.75 (10.80)	2.89 (9.59)	3.43 (10.43)	3.16 (10.01)
T20	TN-1	19.45 (25.94)	22.59 (28.15)	21.02 (27.04)	23.45 (28.61)	25.37 (30.07)	24.41 (29.34)	21.45 (27.30)	23.98 (29.15)	22.71 (28.22)
	SEm±	(1.40)	(1.46)	(0.91)	1.54)	1.45)	0.97)	1.24)	1.19)	0.79)
	CD 5%	(4.00)	(4.18)	(2.56)	4..40)	4.16)	2.72)	3.56)	3.40)	2.20)
	CV%	(16.35)	(15.82)	(14.54)	(16.68)	14.54)	14.28)	13.93)	12.34)	11.96)

Table 4: Yield of rice grain in some rice genotype

	Genotype	Yield of rice grain (q/ha)		
SN.		**2016**	**2017**	**Pooled Mean**
T1	CR Dhan – 303	50.27	52.12	51.19
T2	IR-20	39.53	40.72	40.13
T3	MTU- 1010	47.57	48.92	48.24
T4	IR-64 Drt.	41.70	42.68	42.19
T5	Naveen	40.77	42.16	41.47
T6	Sahbhagi	47.42	48.78	48.10
T7	Pusa- 1176	27.53	28.73	28.13
T8	Abhisek	49.35	50.22	49.78
T9	IR-36	49.77	50.92	50.34
T10	CR Dhan – 304	43.60	44.87	44.23
T11	Achhay Dhan	60.47	61.83	61.15
T12	IR-64 Sub-1	43.70	44.73	44.22
T13	CR Dhan -205	51.87	53.30	52.58
T14	DRR-44	45.67	47.07	46.37
T15	BVS-1	34.52	35.78	35.15
T16	Kavya	45.30	46.73	46.02
T17	Lalat	50.23	51.67	50.95
T18	Advanta-801+	58.57	60.03	59.30
T19	Suraksha	30.37	31.90	31.14
T20	TN-1	21.03	22.43	21.73
	SEm±	2.40	2.45	1.54
	CD 5%	6.87	7.03	4.31
	CV%	9.46	9.39	9.42

Conclusion

The experimental results of field screening of 20 rice genotype against yellow stem borer revealed that Suraksha, Kavya, Lalat, CR Dhan – 303, CR Dhan – 205, CR Dhan – 304, Sahbhagi Dhan, IR-36 and Naveen were found to be tolerant/ resistant to YSB. As such considerably higher grain yield of rice grains were obtained. The test genotype could be arranged in descending order of: Achhay Dhan (61.15 q/ha) > Advanta-801^{+} (59.30 q/ha) > CR Dhan -205 (52.58 q/ha) > CR Dhan – 303 (51.16 q/ha) > Lalat (50.95 q/ha) > IR-36 (50.34 q/ha) > Abhisek (49.78 q/ha) in terms of grains yield and all these seven genotype remained statistically at par. TN-1 appeared as susceptible to yellow stem borer.

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