The Pharma Innovation Journal 2023; SP-12(10): 265-266

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(10): 265-266

www.thepharmajournal.com
Received: 08-08-2023
Accepted: 16-09-2023

Rajat Deshwal
Department of Entomology, Sardar Vallabhbhai Patel University of Agriculture & Technology Meerut, Uttar Pradesh, India

SK Sachan
Department of Entomology, Sardar Vallabhbhai Patel University of Agriculture & Technology Meerut, Uttar Pradesh, India

Mohit Tomar
Department of Entomology, GBPUAT, Pantnagar, Uttarakhand, India

Corresponding Author:
Rajat Deshwal
Department of Entomology, Sardar Vallabhbhai Patel University of Agriculture & Technology Meerut, Uttar Pradesh, India

Assessment of avoidable yield loss due to major insect-pests of basmati rice in western plain zone of Uttar Pradesh

Rajat Deshwal, SK Sachan and Mohit Tomar

Abstract
Field experiment was conducted to assessment of avoidable yield loss due to major insect- pests of basmati rice in western plain zone of Uttar Pradesh during *Kharif*, 2017 and 2018 at Crop Research Center of Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut (U.P.), India. There were two treatments, unprotected and protected which were replicated three times. The grain yield of treated and untreated plots was recorded at the time of harvest. The avoidable loss was recorded 47.55 and 44.10 percent during *Kharif*, 2017 and 2018, respectively.

Keywords: Insect pests, basmati rice, avoidable loss

1. Introduction
In the World, rice is grown about in 167.24 million ha with an annual production of 769.65 million tonnes and 46.02 q/ha of productivity. In India, rice crop occupies an area of about 43.78 million ha with a total production of 168.50 million tones and the productivity of 38.50 q/ha [1]. Pests and diseases form a major group of constraints in achieving the targeted grain yield of paddy in India. The insect pests scenario in rice crop has undergone tremendous change in the recent years and many pests of minor importance have started assuming a major status [6]. Insect pests are responsible for considerable yield reduction of various crops in tropical Asian countries [8]. About 128 species of insects have been reported to ravage the rice field. Out of this only 15 to 20 insects are regarded as economically obnoxious species [4].
Haryana, Punjab, Uttaranchal, Uttar Pradesh and Jammu Kashmir are the States, where basmati rice is grown in our country. Basmati rice crop suffers severely due to attack of various insect pests, which reduces its yield and quality. In general, yield loss due to insect pest of rice has been estimated at about 25% in different rice ecosystem [7]. Therefore, the detailed studies on assessment of avoidable yield loss due to major insect- pests of basmati rice have been undertaken.

2. Materials and Methods
The present study was conducted at the Crop Research Centre of Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, U.P., India during *Kharif* 2017 and 2018. The crop was raised in a paired plot with spray of Lambda- cyhalothrin 2.5 EC at weekly intervals and replicated thrice. The plot size was kept 5×4 m^2 with row to row and plant to plant distance 20×20 cm, respectively. The grain yield of treated and untreated plots was recorded at the time of harvest. The data of grain yield were converted into quintal per hectare. The avoidable losses and increase in the yield of grain over control were calculated using following formula on suggested by Atwal and Singh (1990) [2]

$$\text{Avoidable losses (\%)} = \frac{\text{(Yield in protected plots – Yield in unprotected plots)}}{\text{Yield in protected plots}} \text{X } 100$$

$$\text{Increase in the yield (\%)} = \frac{\text{(Yield in the treatment – Yield in control)}}{\text{Yield in control}} \text{X } 100$$

3. Results and Discussion
The result reveals that mean grain yield was 40.21 and 43.83 q/ha in treated plots and

21.09 and 24.50 q/ha in untreated plots during 2017 and 2018, respectively. Therefore, the yield obtained in two treatments (treated and untreated) differed from each other. In present investigation, increase in crop yield over control during *Kharif* 2017 and *Kharif* 2018 was 19.12 and 19.33 q/ha, respectively and percent increase in yield over control during *Kharif* 2017 and *Kharif* 2018 was 90.65 and 78.09 percent, respectively (Table 1 and Figure 1).

The losses due to insect pests of rice could be avoided by pest control measures and the production can be increased. The percent avoidable yield loss were calculated 47.55 and 44.10 percent during *Kharif* 2017 and *Kharif* 2018, respectively, with pooled mean of 45.76 percent. The similar results were also recorded by Bhadauria and Singh (2009) [3]. who reported 84.2 percent yield loss due to gundhi bug, *Leptocorisa acuta* in rice crop. Mane and Kulkarni (2011) [5] reported percent yield loss due to brinjal pests in term of number of fruits per plant was 40.35%, which are in accordance with the present findings. The varied damage caused by insect pests of rice was due to the varied from biotic and abiotic factors of various localities.

Table 1: Assessment of yield losses due to major insect pests of basmati rice (*Kharif*, 2017 and 2018)

Treatment	Yield (q/ha)			Increase in yield over control (%)			Avoidable losses (%)		
	2017	2018	Pooled	2017	2018	Pooled	2017	2018	Pooled
Treated	40.21	43.83	42.02	90.65	78.89	84.37	47.55	44.10	45.76
Untreated	21.09	24.50	22.79						
Increase in yield	19.12	19.33	19.22						

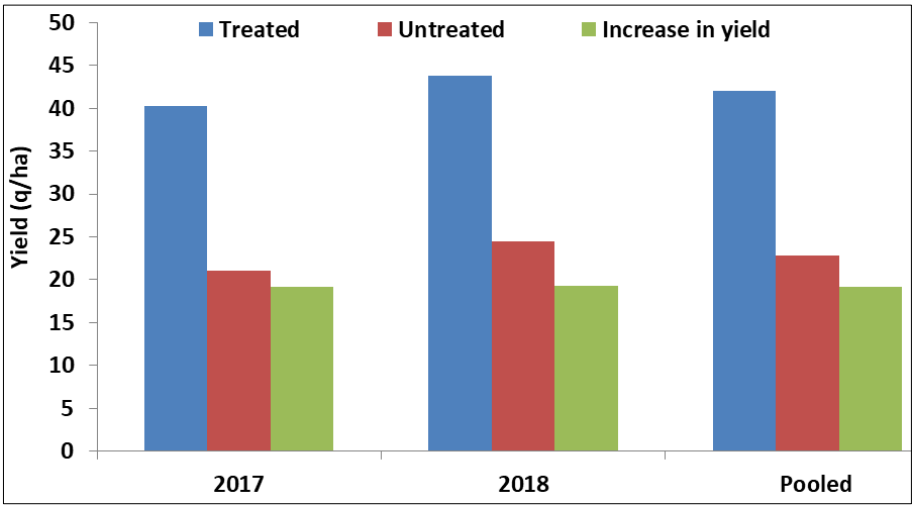

Fig 1: Assessment of yield losses due to major insect pests of basmati rice (*Kharif*, 2017 and 2018)

4. Conclusion

The present investigation it may be concluded that yellow stem borer (*Scirpophaga incertulas*) and leaf folder (*Cnaphalocrocis medinalis*) were the major pests of basmati rice in Western region of Uttar Pradesh. The infestation by these insect pests were influenced by one or more abiotic factors and crop stages. The maximum increase in yield over control was 90.65 and 78.89 percent during *Kharif*, 2017 and 2018, respectively. The avoidable loss was found 47.55 and 44.10 percent in *Kharif*, 2017 and 2018, respectively.

5. Acknowledgement

The authors are thankful to Head of Department of Entomology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, and entire faculty for providing necessary facilities and laboratory for conducting the investigation.

6. References

1. Anonymous. Food and agriculture organization, http.//faostat.fao.org, 2017.
2. Atwal AS, Singh B. Pest population and assessment of crop losses. Indian Council of Agricultural Research; c1990.
3. Bhadauria NS, Singh P. Assessment of losses in paddy caused by Leptocorisa varicornis. Annals of Plant Protection Sciences. 2009;17(1):231.
4. Kalode MB, Sharma SD, Nayak BC. Insect pest of rice and their management in Indian Perspectiveeds. Today and tomorrow printers and publishers (India). 2005, 819-854.
5. Mane PD, Kulkarni SN. Assessment of crop loss due to brinjal pest complex. International Journal of Plant Protection. 2011;4(1):82-85.
6. Pathak MD, Khan ZR. Insect Pests of Rice, IRRI, Manila, Philippines; c1994. p. 89.
7. Saini UP, Sachan SK, Singh APB, Kumar K. Insect pests associated with basmati rice in western plain zone of Uttar Pradesh, India. Plant Archives. 2015;15(2):775-777.
8. Savary S, Willocquet L, Elazegui FA, Castilla NP, Teng PS. Rice pest constraints in tropical Asia: quantification of yield losses due to rice pests in a range of production situations. Plant Disease. 2000;84(3):357-369.