

Short Note

Incidence of bunt in major paddy growing districts in Haryana¹S.S. JAKHAR, ¹SUNIL KUMAR and ²ANIL KUMAR MALIK¹Department of Seed Science and Technology, ²Department of Extension Education, CCS HAU, Hisar-125004 (Haryana)**Key words:** Bunt, incidence, paddy, *Oryza sativa*

Rice (*Oryza sativa* L.) is a staple food for the majority of the world's population. India ranks first in the area under rice and second in production in the world. In India, it is grown over 43.79 million hectares with production and productivity of 112.91 million tonnes and 2578 kg/ha, respectively. However, area under rice cultivation in Haryana is 1.42 million ha with 4.52 million tonnes production and 3181 kg/ha productivity, respectively during 2017-18 (Saxena *et al.*, 2018). Rice is affected by various insects, pests, fungi, bacteria and nematodes which are main causes of yield instability. The yield loss varies from 20-40 per cent out of total global agricultural production due to insects, pests and pathogens (Oerke, 2006).

Kernel smut (*Tilletia barclayana*) of rice also known as paddy bunt (*Neovossia horrida*) was firstly reported by Takahasi in 1896 from Japan and later on by Anderson in 1899 from USA. The disease is prevalent worldwide and has been reported from all major rice growing countries (Santosh *et al.*, 1996 and Moletti *et al.*, 1996). In India, the disease was first reported by Butler in 1913. Since then, it has spread to all the rice growing states of the country (Sharma, 2001). The economic importance of the disease has been highlighted by various workers from different parts of the world; where the losses have been reported to be ranging from 2- 63% (Sharma, 2001). The disease has made losses to seed producers in Haryana state resulting in rejection of quality seed for not meeting the minimum tolerance standards of 0.50 and 0.10% for certified and foundation seeds, respectively. Gathering information on this aspect through roving surveys helps in prioritization and formulation of need based research projects and in solving the farmers' problem on the spot.

Paddy seed samples (1kg each) of commercially cultivated varieties were collected randomly from farmers as well as seed processing plants (unprocessed certified) of Haryana state during the year 2015 to 2018. The observations were recorded in terms of number of samples tested, infected samples and average bunt infection in the collected samples. These seed samples were analysed for the presence of rice bunt infection in seed pathology

laboratory of Seed Science and Technology, Department of CCS Haryana Agricultural University, Hisar with a view to find out the spread and occurrence for paddy bunt. The seed samples were analysed in 0.2 per cent NaOH solution as per sodium hydroxides oak method described by (Agrawal, 1985) for detection of paddy bunt. Each sample were replicated twice (2000 seeds each).

Paddy bunt is a designated disease present all over India in major paddy growing regions. The perusal of data in Table 1 shows that eight districts of Haryana state were surveyed during the year 2015 to 2018. The survey indicates the number of samples tested during the year 2015 was 350 and among them 124 samples were found infected having average infection percentage from 0.023 to 0.182. The minimum average infection was recorded from two districts viz., Hisar and Fatehabad (0.023%) and maximum was from Karnal (0.0182%) during that year. In 2016, a total of 385 samples were tested, out of which 134 were found infected having average infection percentage from 0.023 to 0.076. The minimum average bunt infection was recorded from Fatehabad (0.023%) and the maximum was observed in Kurukshetra (0.076%). During 2017, a total of 298 samples were tested and among them 56 were found infected having average infection percentage from 0.04 to 0.047. The minimum average infection was recorded from Kaithal (0.004%) and maximum was from Yamunanagar (0.047%). During the last year of survey 2018, a total of 563 samples were examined, out of which 82 samples were found infected having average infection percentage from 0.005 to 0.019. The minimum average infection was recorded in Sirsa (0.005%) and maximum was found in Yamunanagar (0.019%). Similar results were also reported by Mandhare *et al.*, (2008) and Duhan and Jakhar (2000).

The data presented in Table 2 (2015 to 2018) was representing different Seed Corporation processing plants (Unprocessed Seed) in three districts viz., Kurukshetra, Yamuna nagar and Karnal. In the initial year of survey (2015), only 36 samples were found infected out of 105 samples analysed having average infection of bunt 0.018, 0.018 and 0.020 per cent in Kurukshetra, Yamunanagar

Table 1: Analysis of bunt in Farmers' seed samples**Location: Different farmers seed samples**

Districts	2015			2016			2017			2018		
	No of Samples Tested	No of Samples Infected	Average Bunt Infection	No of Samples Tested	No of Samples Infected	Average Bunt Infection	No of Samples Tested	No of Samples Infected	Average Bunt Infection	No of Samples Tested	No of Samples Infected	Average Bunt Infection
Jind	106	23	0.039	80	23	0.026	88	11	0.009	104	12	0.006
Kurukshetra	37	20	0.156	85	36	0.076	21	6	0.026	125	21	0.014
Yamunanagar	35	20	0.131	45	14	0.034	20	10	0.047	46	9	0.019
Karnal	17	10	0.182	24	9	0.031	35	17	0.035	50	9	0.018
Hisar	82	11	0.023	62	17	0.026	37	2	0.005	94	15	0.009
Kaithal	23	11	0.069	29	13	0.065	31	3	0.004	57	6	0.006
Sirsa	30	16	0.1	13	5	0.038	23	5	0.015	45	5	0.005
Fatehabad	20	13	0.023	47	17	0.023	43	2	0.008	42	5	0.007
Total	350	124	0.082	385	134	0.033	298	56	0.014	563	82	0.01

Table 2: Analysis of bunt in Seed Corporation samples**Location: Unprocessed seed of different Seed Corporations**

Districts	2015			2016			2017			2018		
	No of Samples Tested	No of Samples Infected	Average Bunt Infection	No of Samples Tested	No of Samples Infected	Average Bunt Infection	No of Samples Tested	No of Samples Infected	Average Bunt Infection	No of Samples Tested	No of Samples Infected	Average Bunt Infection
Kurukshetra	40	12	0.018	45	13	0.021	55	8	0.008	26	4	0.019
Yamunanagar	30	10	0.018	34	9	0.019	45	8	0.013	24	4	0.022
Karnal	35	14	0.02	32	8	0.018	40	9	0.011	31	6	0.024
Total	105	36	0.019	111	30	0.019	140	25	0.01	81	14	0.022

and Karnal districts respectively.

A total of 111 samples were analysed during 2016, out of which 30 samples were found infected. The average infection recorded was 0.021, 0.019 and 0.018 per cent in Kurukshetra, Yamunanagar and Karnal districts respectively.

In 2017, a total of 140 samples were collected from three districts and analysed for bunt infection. Only 25 samples were found infected with bunt. The average infection was 0.008, 0.013 and 0.011 per cent in Kurukshetra, Yamunanagar and Karnal districts respectively.

During the last year of survey in year 2018, a total of 81 samples were analyzed and 14 were found infected. The average bunt infection was 0.019, 0.022 and 0.024 per cent in Kurukshetra, Yamunanagar and Karnal districts respectively.

CONCLUSION

Since the pathogen perennates through soil-borne teleutospores and sporidia produced on the latter get disseminated by air currents, the chemical seed-treatment device does not prove to be of any advantage. The recommended control measures for this disease are field sanitation, crop rotation and use of resistant varieties.

The bunt disease has been reported from many other states viz., Uttar Pradesh, Bihar, Orissa and Andhra in the country. Reports of seed rejection due to bunt are also available. Similarly in Haryana, the incidence of bunt has been found continuously during the survey period, however in decreasing trend from 0.082 to 0.010 per cent. The difference in bunt infection might be due to local weather conditions and general management practices of the crop vis-a-vis disease. In the last year of survey 2018, the lowest infection was observed in Sirsa district. So the present study suggests that production of disease free seed or with less incidence of disease can be taken from Sirsa followed by Kaithal and Jind districts of Haryana.

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