



Aerospace Information Research Institute, Chinese Academy of Sciences

Key laboratory of Digital Earth Science, Chinese Academy of Sciences

State Key Laboratory of Remote Sensing Science

Sino-UK Crop Pest and Disease Forecasting & Management Joint Laboratory

Key Lab of Aviation Plant Protection, Ministry of Agriculture and Rural Affairs, P.R. China

National Engineering Research Center for Agro-Ecological Big Data Analysis & Application

Crop pests and diseases monitoring and forecasting Global

September 2020

Pests will occur heavier than diseases on rice Global

Affected areas are estimated to reach 20.1 million ha

Overview

Integrated with multi-source Earth Observation data, e.g. meteorological data, field data, and remote sensing data (such as GF series in China, MODIS and Landsat series in US, Sentinel series in EU), and self-developed models and algorithms for crop pest and disease monitoring and forecasting, the research team constructed the 'Vegetation pests and diseases monitoring and forecasting system', which could regularly release thematical maps and reports on main crop pests and diseases at global scale.

During September 2020, pest will occur heavier than disease in main rice production countries, the total damaged areas are estimated to reach 20.1 million hectares, mainly occurred in India, Thailand, Bangladesh, Myanmar, Vietnam, Philippines, Cambodia, Pakistan, Nepal, Japan,

Content

Overview	1
Rice blast	1
Rice planthopper	3
Contact us	5

United States, South Korea, Laos and Iran. The areas affected by rice blast (*Magnaporthe oryzae*) are estimated to reach 5.3 million hectares, accounting for 5% of the total planting area. The areas affected by rice planthopper (*Nilaparvata lugens*) are estimated to reach 14.8 million hectares, accounting for 13% of the total planting area.

Rice blast

The distribution, occurrence area and ratio of rice blast in rice production countries is shown in Figure 1 and Table 1. The rice planted area of India is 44 million hectares, the total affected

areas of blast are estimated to reach 208 ten thousand hectares, accounting for 5% of the total planting area, will mainly occur in Assam and north-eastern regions, Gangatic plain and Western coastal region. The rice planted area of the Thailand is 12.7 million hectares, the total affected areas of blast are estimated to reach 68 ten thousand hectares, accounting for 5% of the total planting area, will mainly occur in South-eastern horticulture area and Central double and triple-cropped rice lowlands. The rice planted area of Bangladesh is 10.0 million hectares, the total affected areas of blast are estimated to reach 41 ten thousand hectares, accounting for 4% of the total planting area, will mainly occur in Coastal region, central Gangetic plain and southern Sylhet basin. The rice planted area of Myanmar is 7.3 million hectares, the total affected areas of blast are estimated to reach 29 ten thousand hectares, accounting for 4% of the total planting area, will mainly occur in Central plain and southern Hills. The rice planted area of Vietnam is 7.3 million hectares, the total affected areas of blast are estimated to reach 53 ten thousand hectares, accounting for 7% of the total planting area, will mainly occur in Southern zone with Mekong Delta. The rice planted area of Philippines is 4.0 million hectares, the total affected areas of blast are estimated to reach 6 ten thousand hectares, accounting for 2% of the total planting area, will mainly occur in Forest area and Hills. The rice planted area of Cambodia is 3.3 million hectares, the total affected areas of blast are estimated to reach 36 ten thousand

hectares, accounting for 11% of the total planting area, will mainly occur in Central Tonle-Sap plain and southern Upland areas. The rice planted area of Pakistan is 2.7 million hectares, the total affected areas of blast are estimated to reach 23 ten thousand hectares, accounting for 9% of the total planting area, will mainly occur in Northern Punjab and Lower Indus river basin in south Punjab and Sind. The rice planted area of Nepal is 2.0 million hectares, the total affected areas of blast are estimated to reach 3 ten thousand hectares, accounting for 2% of the total planting area, will mainly occur in eastern region. The rice planted area of Japan is 1.5 million hectares, the total affected areas of blast are estimated to reach 17 ten thousand hectares, accounting for 11% of the total planting area, will mainly occur in central region. The rice planted area of United States is 1.1 million hectares, the total affected areas of blast are estimated to reach 13 ten thousand hectares, accounting for 12% of the total planting area, will mainly occur in Lower Mississippi. The rice planted area of South Korea is 0.8 million hectares, the total affected areas of blast are estimated to reach 3 ten thousand hectares, accounting for 4% of the total planting area, will mainly occur in western regions. The rice planted area of Laos is 0.7 million hectares, the total affected areas of blast are estimated to reach 2 ten thousand hectares, accounting for 3% of the total planting area, will mainly occur in Attapu and Champassak. The rice planted area of Iran is 0.6 million hectares, the total affected areas of blast are estimated to reach 6 ten

thousand hectares, accounting for 11% of the total planting area, will mainly occur in Semi-arid

to sub-tropical hills of the west and the north.

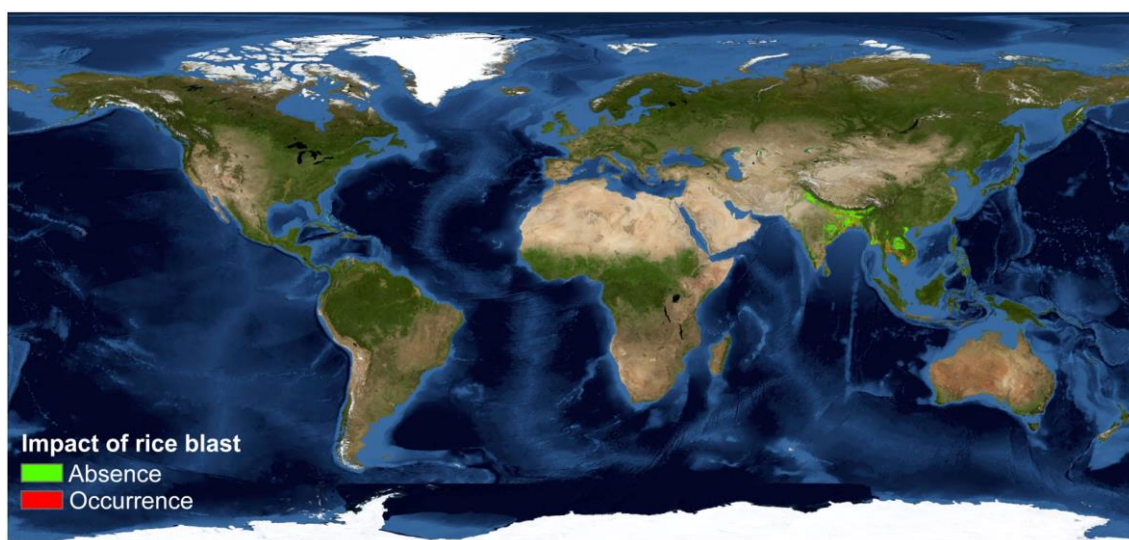


Figure 1 Spatial distribution of rice blast

Rice planthopper

The distribution, occurrence area and ratio of rice planthopper in rice production countries is shown in Figure 2 and Table 1. The total affected areas of planthopper in India are estimated to reach 907 ten thousand hectares, accounting for 21% of the total planting area, will mainly occur in Assam and north-eastern regions and Gangatic plain. The total affected areas of planthopper in Thailand are estimated to reach 161 ten thousand hectares, accounting for 13% of the total planting area, will mainly occur in Single-cropped rice north-eastern region and Central double and triple-cropped rice lowlands. The total affected areas of planthopper in Bangladesh are estimated to reach 41 ten thousand hectares, accounting for 4% of the total planting area, will mainly occur in western Gangetic plain. The total affected areas of planthopper in Myanmar are estimated to reach 37 ten thousand hectares,

accounting for 5% of the total planting area, will mainly occur in Central plain and western Hills. The total affected areas of planthopper in Vietnam are estimated to reach 165 ten thousand hectares, accounting for 23% of the total planting area, will mainly occur in Northern zone Red river Delta, central coastal area and the southernmost region. The total affected areas of planthopper in Philippines are estimated to reach 23 ten thousand hectares, accounting for 6% of the total planting area, will mainly occur in northern Lowlands. The total affected areas of planthopper in Cambodia are estimated to reach 66 ten thousand hectares, accounting for 20% of the total planting area, will mainly occur in southern Upland areas. The total affected areas of planthopper in Pakistan are estimated to reach 33 ten thousand hectares, accounting for 12% of the total planting area, will mainly occur in

Northern Punjab. The total affected areas of planthopper in Nepal are estimated to reach 4 ten thousand hectares, accounting for 2% of the total planting area, will mainly occur in central region. The total affected areas of planthopper in Japan are estimated to reach 13 ten thousand hectares, accounting for 9% of the total planting area, will mainly occur in central region and southern region. The total affected areas of planthopper in

South Korea are estimated to reach 8 ten thousand hectares, accounting for 11% of the total planting area, will mainly occur in central regions and southern regions. The total affected areas of planthopper in Laos are estimated to reach 23 ten thousand hectares, accounting for 35% of the total planting area, will mainly occur in southern regions.

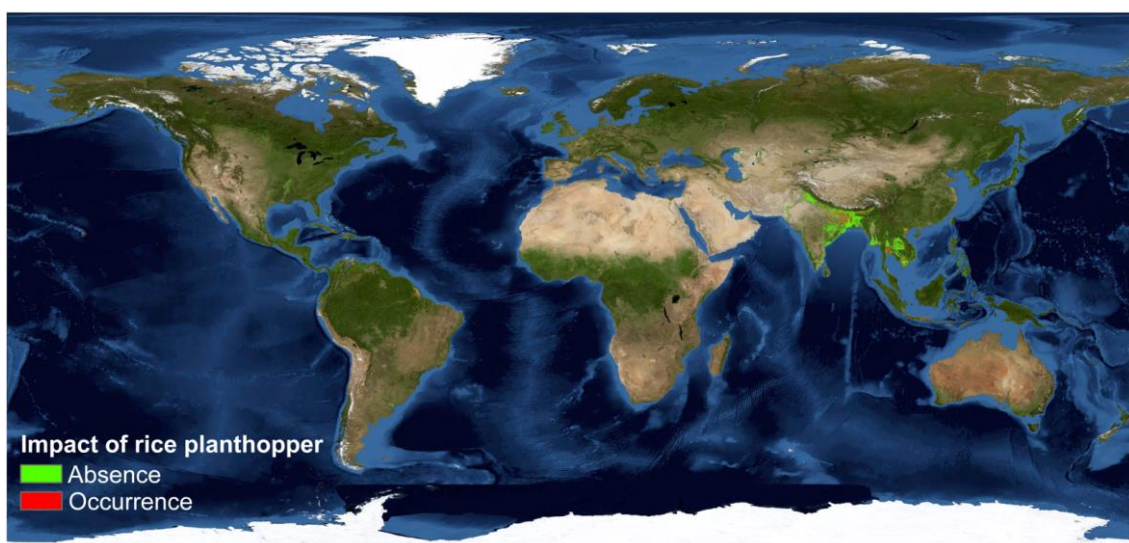


Figure 2 Spatial distribution of rice planthopper

Table 1 Statistics of rice blast and planthopper

Rice production countries	Blast occurrence area and ratio		Planthopper occurrence area and ratio		Total planting area / million hectares
	Area / ten thousand hectares	Ratio / %	Area / ten thousand hectares	Ratio / %	
India	208	5	907	21	44
Thailand	68	5	161	13	12.7
Bangladesh	41	4	41	4	10
Myanmar	29	4	37	5	7.3
Vietnam	53	7	165	23	7.3
Philippines	6	2	23	6	4
Cambodia	36	11	66	20	3.3
Pakistan	23	9	33	12	2.7
Nepal	3	2	4	2	2
Japan	17	11	13	9	1.5
United States	13	12	0	0	1.1
South Korea	3	4	8	10	0.8
Laos	2	3	23	34	0.7
Iran	6	11	0	0	0.6

Note: Please refer to China chapter of the report for China's rice pests and diseases results.

Contact us

Aerospace Information Research Institute
Chinese Academy of Sciences

No.9 Dengzhuang South Road, Haidian District,
Beijing 100094, P.R.China.

<http://www.rscrop.com/>

<http://www.rscropmap.com>



Chinese English

The Vegetation Pests and Diseases Monitoring and
Forecasting system are available under:

<http://www.rscropmap.com/>

Legal Notice

Neither the Aerospace Information Research Institute nor any person action on behalf of the institute is responsible for the use which might be made of the publication.

Disclaimer

This report is a product of the Vegetation Remote Sensing & Pest and Disease Application Research Team of the Aerospace Information Research Institute, Chinese Academy of Sciences. The analyses and conclusions in the report do not represent the views of the Chinese Academy of Sciences or the Aerospace Information Research Institute. Users can legally quote the data in this report and indicate the source. However, any judgments, inferences or opinions made based on the report do not represent the views of the Team. The data published in this report are for reference only. The Team does not bear any legal responsibility arising from the use of the report. Official Chinese boundaries are used in the report.

Mission statements: As the science and knowledge service, the Sino-UK Crop Pest and Disease Forecasting & Management Joint Laboratory is to support independent evidence for crop monitoring.

Supported by the Strategic Priority Research Program of the Chinese Academy of Sciences (XDA19080304), National Key R&D Program of China (2017YFE0122400, 2016YFB0501501), National Natural Science Foundation of China (61661136004, 41801338, 41801352, 41871339), Beijing Nova Program of Science and Technology

(Z191100001119089), National special support program for high-level personnel recruitment (Wenjiang Huang), and Youth Innovation Promotion Association CAS (2017085).

Contact us **Email:** rscrop@aircas.ac.cn

Corresponding author

Professor Wenjiang Huang

Aerospace Information Research Institute, Chinese Academy of Sciences

Email: huanwj@aircas.ac.cn

Tel: +86-10-82178178

FAX: +86-10-82178177

Main contributors

This report was released by Professor Wenjiang Huang's and Associate Professor Yingying Dong's research team in Aerospace Information Research Institute, Chinese Academy of Sciences.

Chinese contributors: Wenjiang Huang, Yingying Dong, Huichun Ye, Kun Wang, Jingcheng Zhang, Longlong Zhao, Bei Cui, Linsheng Huang, Dailiang Peng, Xiaoping Du, Hong Chang, Huiqin Ma, Anting Guo, Chao Ruan, Linyi Liu, Yun Geng, Naichen Xing, Yue Shi, Qiong Zheng, Yu Ren, Hansu Zhang, Tingguang Hu, Yanru Huang, Yu Jin, Chao Ding, Biyao Zhang, Zhongxiang Sun, Xiangmei Qin, Weiping Kong, Juhua Luo, Jinling Zhao, Dongyan Zhang, Xiaodong Yang, Yanhua Meng, Wenjie Fan, Yue Liu, Gang Sun, Bin Wu, Qing Zhang, Dacheng Wang, Wei Feng, Xianfeng Zhou, Qiaoyun Xie, Muye Huang, Jing Jiang, Zhaochuan Wu, Cuicui Tang, Fang Xu, Jianli Li, Wenjing Liu, Junjing Lu, Furan Song, Qingsong Guan, Qinying Yang, Chuang Liu, Yingxin Xiao, Kang Wu, Yong Liu, Bo Wu, Xuelling Li, Chaojia Nie.

Foreign contributors: Belinda Luke, Bethan Perkins, Bryony Taylor, Hongmei Li, Wenhua Chen, Pablo Gonzalez-Moreno, Sarah Thomas, Timothy Holmes, Stefano Pignatti, Giovanni Laneve, Raffaele Casa, Simone Pascucci, Martin Wooster, Jason Chapman.

Advisory Experts: Bing Zhang, Jihua Wang, Qiming Qin, Puyun Yang, Yuying Jiang, Binyuan Ren, Yubin Lan, Jingfeng Huang, Anhong Guo, Zhanhong Ma, Yilin Zhou, Xiongbing Tu, Wenbing Wu, Feng Zhang, Zhiguo Wang, Lifang Wu, Dong Liang, Yanbo Huang, Chenghai Yang, Liangxiu Han, Ruiliang Pu, Hugh Mortimer, Jon Styles, Andy Shaw, Jadu Dash.