



Aerospace Information Research Institute, Chinese Academy of Sciences

Key laboratory of Digital Earth Science, Chinese Academy of Sciences

Big Earth Data Science Engineering Project (CASEarth)

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

Report of Monitoring and Assessment of Desert Locust in Africa and Asia

Early June 2021

Desert Locust Monitoring in Africa and Asia in 2021

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 Desert Locust 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 Desert Locust.

This report focuses on the analysis of the breeding areas of desert locusts in Asia and Africa and prediction of their potential migration route (Figure 1). The research results are as follows.

Desert Locust Monitoring in Africa and Asia in 2021

At the end of 2020, desert locusts in East Africa and southwest Asia were mainly distributed along the coast of the Red Sea (east coast of Sudan and Eritrea, west coast of Saudi Arabia and Yemen), the central Arabian

Content

Overview	1
Desert Locust Monitoring in Africa and Asia in 2021	1
Contact us	5

Peninsula, and the Horn of Africa (eastern Ethiopia, northern Somalia, and northern Kenya). In addition, deserts locusts were scattered in western Yemen, southwestern Iran, southeastern Kenya and southeastern coast of Kenya.

In January 2021, affected by the cyclone GATI, desert locusts in northern Somalia continued to lay eggs and mature, and desert locust swarms in eastern Ethiopia and northern Somalia invaded into southern Ethiopia, southern Somalia, central and eastern and northern Kenya. At the same time, swarms in southern Kenya moved southwards and invaded the northeast of Tanzania. In late January, swarms from northwestern Somalia and central Ethiopia moved northward into Djibouti and Eritrea, and swarms from western Yemen spread northward along the coast of

Red Sea to the southwestern coast of Saudi Arabia. In early and middle February, locust swarms from northwestern Somalia continued to invade Djibouti and Eritrea, swarms of central Ethiopia, southern Somalia and eastern Kenya moved westward to the Lake Turkana in northwest Kenya, and swarms from the coast of Red Sea in western Saudi Arabia moved eastward to the central desert area. In late February, swarms from southern Kenya moved southward into northern Tanzania, while swarms from western and central Saudi Arabia continued eastward to the border with Kuwait. In March, impacted by ground control actions and less rainfall, the numbers of desert locusts in Ethiopia and Somalia decreased gradually. Swarms in Eritrea moved northward along the Red Sea to the east coast of Sudan; swarms in central Saudi Arabia with strong east wind invaded Kuwait and moved across the Persian Gulf to the southwestern Iran. In April, as ground control operations continued, desert locust populations continued to decline in the Horn of Africa. In middle April, locusts from the central and western coasts of Saudi Arabia spread to Jordan and Syria with southerly winds, invaded southern and eastern Jordan on the April 15, and reached the Euphrates River valley near the Iraq and Syria border on the April 17. In late April, locusts in Jordan spread further to the western and central regions with the south winds and moved northward into western Syria. On April 22, some locust swarms crossed the Anti-Lebanon Mountains and entered Lebanon. By the end of the month, some locusts spread to the banks of the Euphrates River valley in western Iraq. The locust swarms in all three countries were small because of control operations. In May, desert

locusts from the Horn of Africa kept laying eggs, hatching, and forming hopper bands. In the spring breeding area of central Saudi Arabia, locusts formed immature adults and migrated to southern Yemen. At the same time, low numbers of solitary adults persist along the Red Sea coastal plains in Yemen.

At present, most of the desert locusts in Africa and Asia are conducting spring breeding. Due to the ground control operations, the number and size of desert locust swarms have decreased significantly compared with the same period of last year. As the locusts in Iran spawn, breed, and mature, it is expected that the locusts may spread eastward to Pakistan in June and July. Affected by the monsoon in July, the locusts in Pakistan would continue to spread eastward to the Indo-Pakistan border, if not effectively controlled. If the monsoon is strong enough, the locusts may invade central India. With the ongoing control operations and dry weather conditions, the hopper bands in the northern interior of Saudi Arabia are expected to gradually decrease, and some locusts are expected to migrate southward to Yemen in June and July for summer breeding. At the same time, due to the impact of rainfall in the Horn of Africa, locusts in eastern Ethiopia and northern Somalia will continue to spawn and mature. It is expected that locusts will spread to northeast Ethiopia in August and September for summer breeding. In the next four months (June to September 2020), countries will usher in the important growing season or harvest season of food crops. If desert locusts continue to wreak havoc, agricultural and animal husbandry production and national livelihood of Asian and African countries will be seriously threatened.

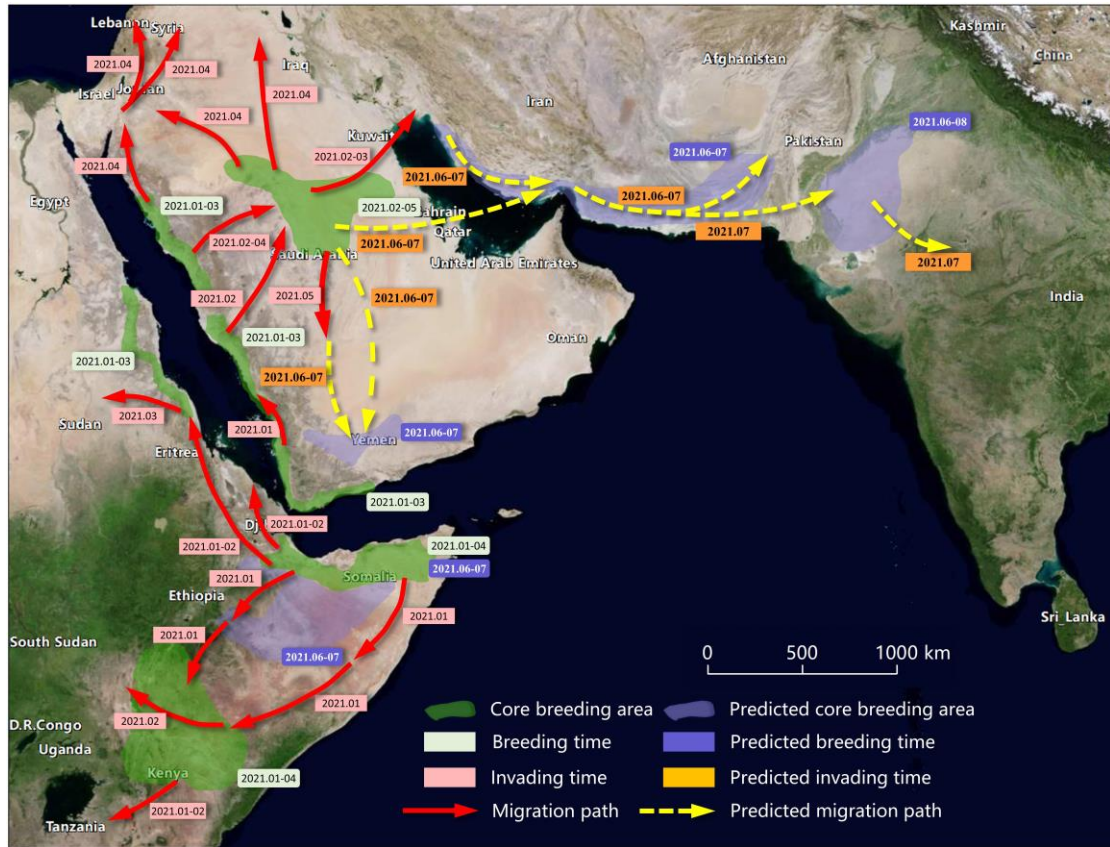


Figure 1 Current situation and prediction of desert locust breeding areas and main migration paths in Asia and Africa in 2021 (June to September)

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).

Citation

Report of Monitoring and Assessment of Desert Locust in Africa and Asia, (2021). Desert Locust Monitoring in Africa and Asia in 2021. Beijing, China: RSCROP. DOI: 10.12237/casearth.60d055f7819aec69f602fe63.

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, Longlong Zhao, Huichun Ye, Mingquan Wu, Kun Wang, Xiaoping Du, Changyong Dou, Jun Yan, Jingcheng Zhang, Bei Cui, Linsheng Huang, Dailiang Peng, Huifang Wang, Hong Chang, Yun Geng, Chao Ruan, Huiqin Ma, Anting Guo, Linyi Liu, Naichen Xing, Yue Shi, Qiong Zheng, Yu Ren, Hansu Zhang, Tingguang Hu, Yanru Huang, Yu Jin, Chao Ding, Biyao Zhang, Zhongxiang Sun, Xiangmei Qin, Xueling Li, , Yingxin Xiao, Zhuoqing Hao, Kang Wu, Yong Liu, Bo Wu, 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, Muiyi Huang, Jing Jiang, Zhaochuan Wu, Cuicui Tang, Fang Xu, Jianli Li, Wenjing Liu, Junjing Lu, Furan Song, Qingsong Guan, Qinying Yang, Chuang Liu, Yunli Han, Yuzhen Zou, Lu Li.

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, Gensuo Jia, Jihua Wang, Qiming Qin, Puyun Yang, Guofei Fang, Shouquan Chai, Yuying Jiang, Jingquan Zhu, Dongmei Yan, Xiangtao Fan, Jianhui Li, Jie Liu, 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.