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

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Aerospace Information Research Institute, Chinese Academy of Sciences
Big Earth Data Science Engineering Project (CASEarth)
Key laboratory of Digital Earth Science, Chinese Academy of Sciences
National Engineering Research Center for Agro-Ecological Big Data Analysis & Application
State Key Laboratory of Remote Sensing Science
China Biodiversity Conservation and Green Development Foundation
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

Desert Locust Monitoring and Loss Assessment in Yemen and Saudi Arabia (March, 2023)

Integrated with multi-source Earth Observation data, e.g. meteorological data, field data, and remote sensing data (such as MODIS in the US, and SDGSAT-1 in China, etc), 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 dynamics of desert locust monitoring and loss assessment in Yemen and Saudi Arabia. The remote sensing monitoring results showed that, in March 2023, the desert locusts were mainly distributed along the Red Sea coast in western Yemen and Saudi Arabia. The total damaged vegetation areas in Yemen and Saudi Arabia were 43.7 and 16.1 thousand hectares, respectively. It is expected that in the next two months, precipitation will increase in the interior of Yemen, as well as in the Red Sea coastal and interior regions of Saudi Arabia, and some adults will diffuse interior to lay eggs and reproduce, causing further increase in the number of desert locusts in Yemen and Saudi Arabia. This period is an important planting season for crops in Yemen and the main growth and harvest seasons for crops in Saudi Arabia. It is still necessary to pay continuous attention to the dynamics of the desert locust disaster in Yemen and Saudi Arabia to prevent losses to its agricultural and pasture production. The specific research results are as follows.

■ 1. Desert Locust Monitoring and Loss Assessment in Yemen

The monitoring results showed that in March, the total damaged vegetation area was 43.7 thousand hectares in Yemen, including 6.4 thousand hectares of grassland, and 37.3

thousand hectares of shrub (Figure 1), accounting for 2.2% and 1.0% of the total area of grassland and shrub, respectively. Compared with February 2023, the newly damaged vegetation area was 30.3 thousand hectares, including 3.5 thousand hectares of grassland, and 26.8 thousand hectares of shrub. Compared with the same period last year, the damage to vegetation caused by desert locusts shows a trend of decreasing. Al-Hudaydah province had the largest area of vegetation affected, with 23.3 thousand hectares. Followed by Amrān province, with 9.4 thousand hectares of vegetation affected. And then Hajjah province, with 8.0 thousand hectares of vegetation affected. The affected areas of vegetation in Al-Mahwīt, San'ā and Raymah provinces were 2.1, 0.7 and 0.2 thousand hectares, respectively.

Fig. 1 Monitoring of Desert Locust damage in Yemen (March 2023)

This study also used SDGSAT-1 satellite remote sensing data to monitor the desert locust damage in the severely damaged vegetation areas in Western Yemen (Figure 2). The study area is located in the Al-Hudaydah province, 32.0 kilometers from Al-Hudaydah in the west and 20.0 kilometers from Bayt Al-Faqīh in the south. In the study area, the total vegetation area is 50.76 thousand hectares, and the affected area of vegetation is 10.07 thousand hectares, accounting for 19.8% of the total vegetation area. Among them, the affected area of grassland was 2.62 thousand hectares, and the affected area of shrub was 7.45 thousand hectares, accounting for 26.8% and 18.1 % of the total area of grassland and shrub in the region, respectively.

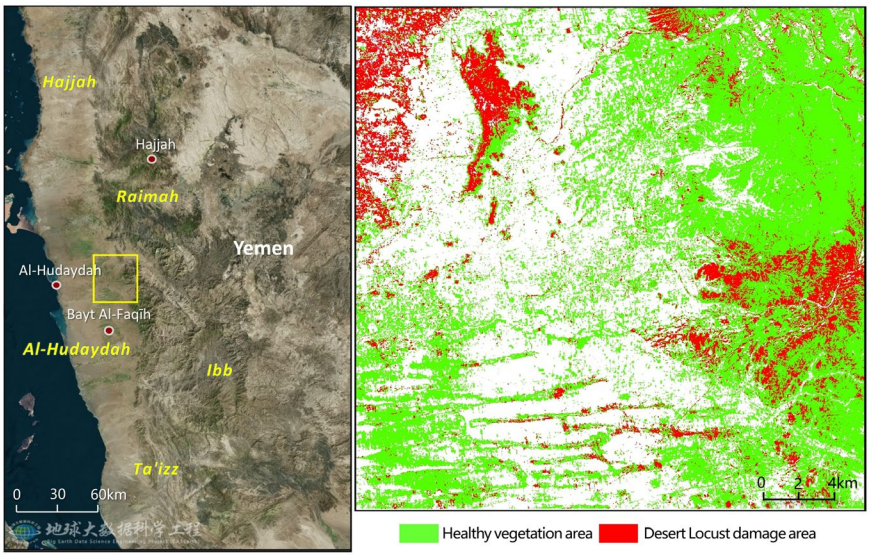

Fig. 2 Monitoring of Desert Locust damage in the key damage areas of Yemen based on SDGSAT-1 images (March 2023)

■ 2. Desert Locust Monitoring and Loss Assessment in Saudi Arabia

In March 2023, the vegetation along the Red Sea coast in western Saudi Arabia was abundant, providing sufficient material conditions for oviparous reproduction, causing a gradual increase in the number of desert locusts. The remote sensing monitoring results showed that in March, the total damaged vegetation area in Saudi Arabia was 16.1 thousand hectares, including 7.7 thousand hectares of cropland, 2.4 thousand hectares of grassland, and 6.0 thousand hectares of shrub (Figure 3), accounting for 0.4%, 0.6%, and 0.3% of the total area of the cropland, grassland and shrub in Saudi Arabia, respectively. The damaged vegetation areas in Makkah province and Al Madīnah province were 13.7 and 2.4 thousand hectares, respectively.

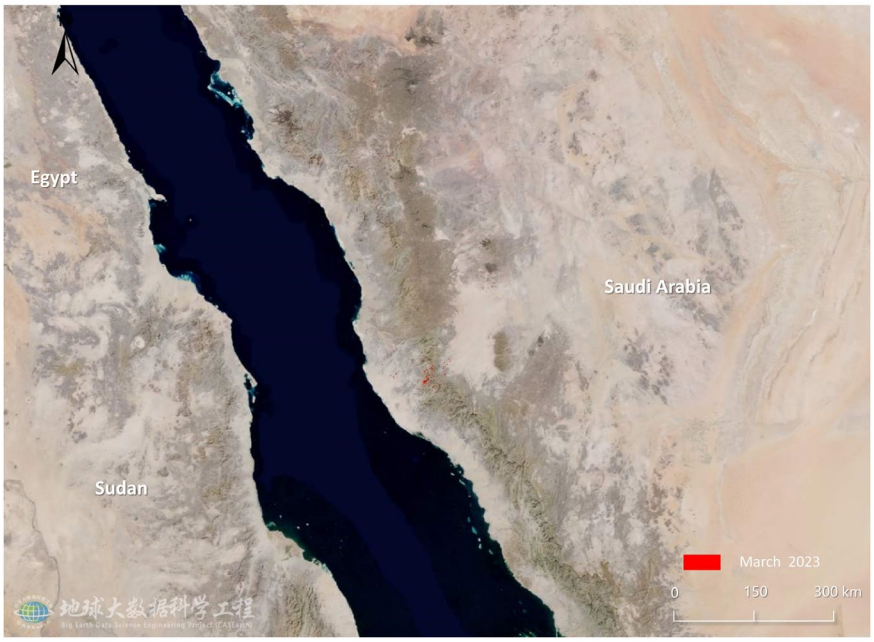

Fig.3 Monitoring of Desert Locust damage in Saudi Arabia (March 2023)

The comprehensive analysis shows that, in the next two months, there will be adequate precipitation in the interior of Yemen, as well as in the Red Sea coastal and interior regions of Saudi Arabia, which will be favorable for the oviparous reproduction of desert locusts, and the number of locusts will further increase. It is still necessary to continue to pay attention to the dynamics of the desert locust disaster in Yemen and Saudi Arabia to prevent repeated losses to its agricultural and pasture production.

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, RuiQi Sun, Yingxin Xiao, Zhuoqing Hao, Jing Guo, Mingxian Zhao, Kehui Ren, Xiangzhe Cheng, 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, Muyi 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, Xinyu Chen, Yunlei Xu, Jing Wang, Qibao Lu, Fanchu Kong, Juncheng Shang.

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, Jinfeng Zhou, Dongmei Yan, Xiangtao Fan, Jianhui Li, Jie Liu, Tianhua Hong,Yubin Lan, Jingfeng Huang, Huo Wang, 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, Jiali Shang, Hugh Mortimer, Jon Styles, Andy Shaw, Jadu Dash.

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Contact Us

Tel: +86-010-82178178 Fax: 010-82178177 Email: rscrop@aircas.ac.cn
Address: No.9 Dengzhuang South Road, Haidian District, Beijing 100094, China
Websites: http://www.rscrop.com / http://desertlocust.rscrop.com Post Code: 100094