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

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 Saudi Arabia

Integrated with multi-source Earth Observation data, e.g. meteorological data, field data, and remote sensing data (such as MODIS in the US, 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 dynamic updates of desert locust monitoring and loss assessment in Saudi Arabia. The remote sensing monitoring results showed that, from August to October 2023, the desert locusts in Saudi Arabia mainly migrated from the inland areas towards the southwest along Red Sea coast. The damaged vegetation areas were 9 thousand hectares, 10.1 thousand hectares, and 11.5 thousand hectares, respectively. It is predicted that in the next two months, abundant rainfall along the Red Sea coast of Saudi Arabia will create favorable conditions for the survival and reproduction of desert locusts. Swarms of locusts from the inland areas of Saudi Arabia are anticipated to continue migrating towards the Red Sea coast, engaging in small-scale breeding. As a result, the insect population along the Red Sea coast is expected to increase. This period is the main planting and growing seasons for crops in Saudi Arabia. It is still necessary to pay continuous attention to the dynamics of the desert locust disaster to prevent losses to agricultural and pasture production. The specific research results are as follows.

■   **1. Desert Locust Monitoring and Loss Assessment in Saudi Arabia**

In August 2023, desert locusts within Saudi Arabia were primarily concentrated in the southwestern inland areas. This region was influenced by tropical cyclones, leading to increased rainfall and providing favorable conditions for the oviposition and reproduction of locusts. The monitoring results showed that in August, the total damaged vegetation area was 9.0 thousand hectares in Saudi Arabia, including 2.3 thousand hectares of cropland, 2.7 thousand hectares of grassland, and 4.0 thousand hectares of shrub (Figure 1), accounting for 0.10%, 0.03%, and 0.02% of the total area of the cropland, grassland, and shrub, respectively. Asīr had the largest area of vegetation affected, with 6.0 thousand hectares. Followed by Jizan, with 2.3 thousand hectares of vegetation affected. The affected areas of vegetation in Al Bāhah were 0.7 thousand hectares.
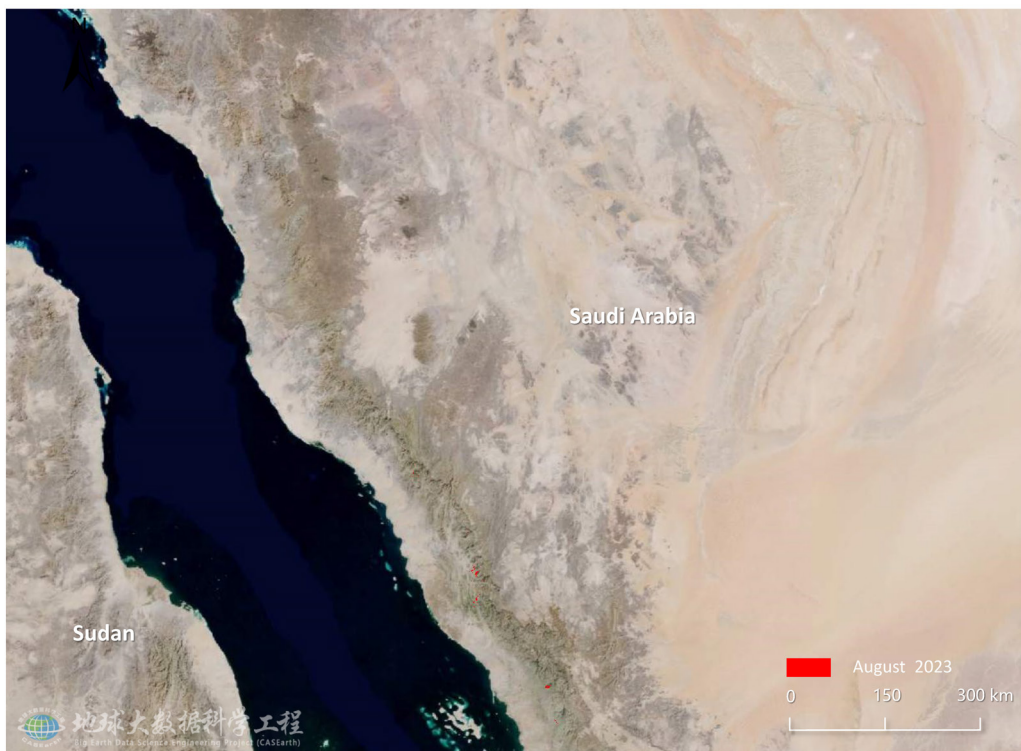
Fig.1 Monitoring of Desert Locust damage in Saudi Arabia (August 2023)

In September 2023, the Red Sea coastal areas in the southwestern part of Saudi Arabia experienced abundant rainfall, resulting in thriving vegetation and providing favorable conditions for the oviposition and reproduction of locusts. Simultaneously, the damage to inland vegetation caused by locusts decreased. As a result, locust swarms from inland areas migrated to the southwestern Red Sea coastal regions, leading to an increase in the number of desert locusts in that area. The monitoring results showed that in September, the total damaged vegetation area was 10.1 thousand hectares in Saudi Arabia, including 2.5 thousand hectares of cropland, 2.9 thousand hectares of grassland, and 4.7 thousand hectares of shrub (Figure 2), accounting for 0.11%, 0.03%, and 0.02% of the total area of the cropland, grassland, and shrub, respectively. Compared with August 2023, the newly damaged vegetation area in Saudi Arabia was 1.1 thousand hectares, including 0.2 thousand hectares of cropland, 0.2 thousand hectares of grassland, and 0.7 thousand hectares of shrubs. Asīr had the largest area of vegetation affected, with 5.3 thousand hectares. Followed by Jizan, with 4.8 thousand hectares of vegetation affected.
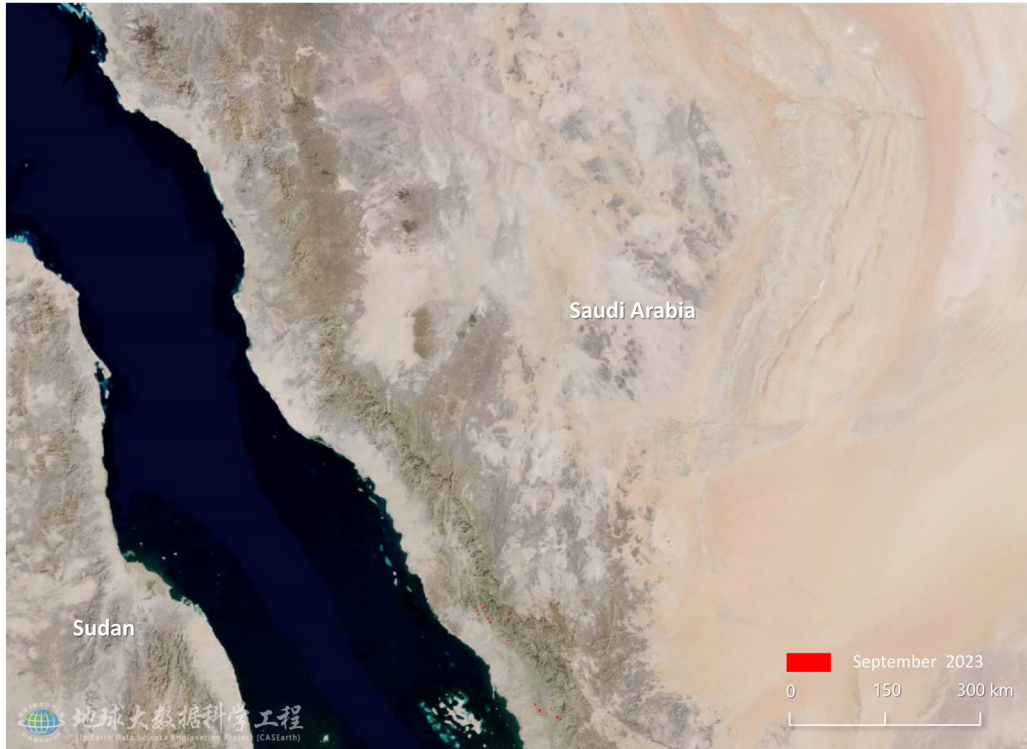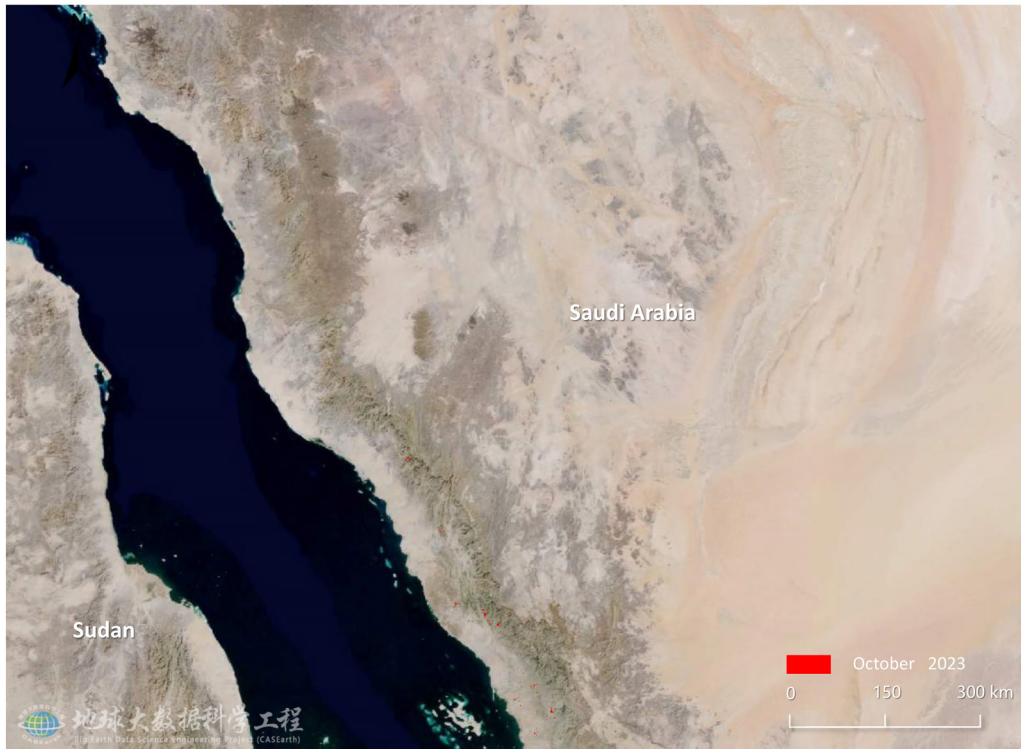
Fig.2 Monitoring of Desert Locust damage in Saudi Arabia (September 2023)

In October 2023, the Red Sea coastal areas in the southwestern part of Saudi Arabia experienced abundant rainfall, resulting in thriving vegetation and providing favorable conditions for the oviposition and reproduction of locusts. Additionally, locust swarms from the northwestern part of Yemen migrated to this area, further contributing to the increase of desert locusts in the region. The monitoring results showed that in October, the total damaged vegetation area was 11.5 thousand hectares in Saudi Arabia, including 1.5 thousand hectares of cropland, 3.5 thousand hectares of grassland, and 6.5 thousand hectares of shrub (Figure 3), accounting for 0.07%, 0.04%, and 0.03% of the total area of the cropland, grassland, and shrub, respectively. Compared with September 2023, the newly damaged vegetation area in Somalia was 1.4 thousand hectares. Jizan had the largest area of vegetation affected, with 5.1 thousand hectares. Followed by Asīr, with 4.6 thousand hectares of vegetation affected. The affected area of vegetation in Al Bāhah was 1.8 thousand hectares.

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

The comprehensive analysis shows that, in the next two months, it is expected that there will be abundant rainfall along the Red Sea coast of Saudi Arabia, creating favorable conditions for the survival and reproduction of desert locusts. Concurrently, locust swarms from the inland areas of Saudi Arabia are expected to continue migrating towards the Red Sea coast, engaging in small-scale breeding. Consequently, the insect population along the Red Sea coast is expected to further increase. It is still necessary to continue to pay attention to the dynamics of the desert locust disaster in Saudi Arabia to prevent repeated losses to agricultural and pasture production.

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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