Report of Monitoring, Early Warning and Assessment of Desert Locust

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Desert Locust Monitoring and Loss Assessment in Eritrea, Saudi Arabia and Yemen (August 2024)

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.

The remote sensing monitoring results showed that, in August 2024, desert locusts were primarily found in the western lowlands and coastal areas of the Red Sea in Eritrea, the central and southern coastal areas of the Red Sea in Saudi Arabia, and the western inland areas of Yemen. These areas experienced significant threats to vegetation, impacting 13.6 thousand hectares, 14.0 thousand hectares, and 30.3 thousand hectares, respectively. It is anticipated that, over the next two months, desert locusts in the western lowlands of Eritrea will lay eggs and reproduce on a small scale and migrate to the coastal areas of the Red Sea, where rainfall will be abundant. Due to rainfall from tropical cyclones, vegetation growth in the coastal areas of the Red Sea in Saudi Arabia and the inland areas of Yemen will be favorable for desert locusts to lay eggs and reproduce, leading to a slight increase in their numbers. This period marks the main growing season for cereal crops in Eritrea and Saudi Arabia, and the main harvest season in Yemen. Continuous monitoring of the desert locust dynamics is essential to prevent recurrent losses in agricultural and pasture production. The specific research results are as follows.

■ 1. Desert Locust Monitoring and Loss Assessment in Eritrea

In August 2024, desert locusts were primarily distributed in the western lowlands and coastal areas of the Red Sea in Eritrea. These areas experienced abundant rainfall, fostering robust vegetation growth, which provided favorable conditions for desert locusts to lay eggs and reproduce, leading to a slight increase in their population. The monitoring results showed that in August, desert locusts damaged 13.6 thousand hectares of vegetation in Eritrea, including 3.2 thousand hectares of farmland, 6.3 thousand hectares of grassland, and 4.1 thousand hectares of shrubland (Figure 1), accounting for 0.73%, 0.13%, and 0.32% of the total area of farmland, grassland, and shrubland, respectively. The Gash Barka region experienced the most extensive damage, with 7.9 thousand hectares of vegetation affected, followed by the Debub region, where 2.8 thousand hectares were impacted. The Debub Keih Bahri and Semien Keih Bahri regions had 1.7 thousand and 1.2 thousand hectares affected, respectively.

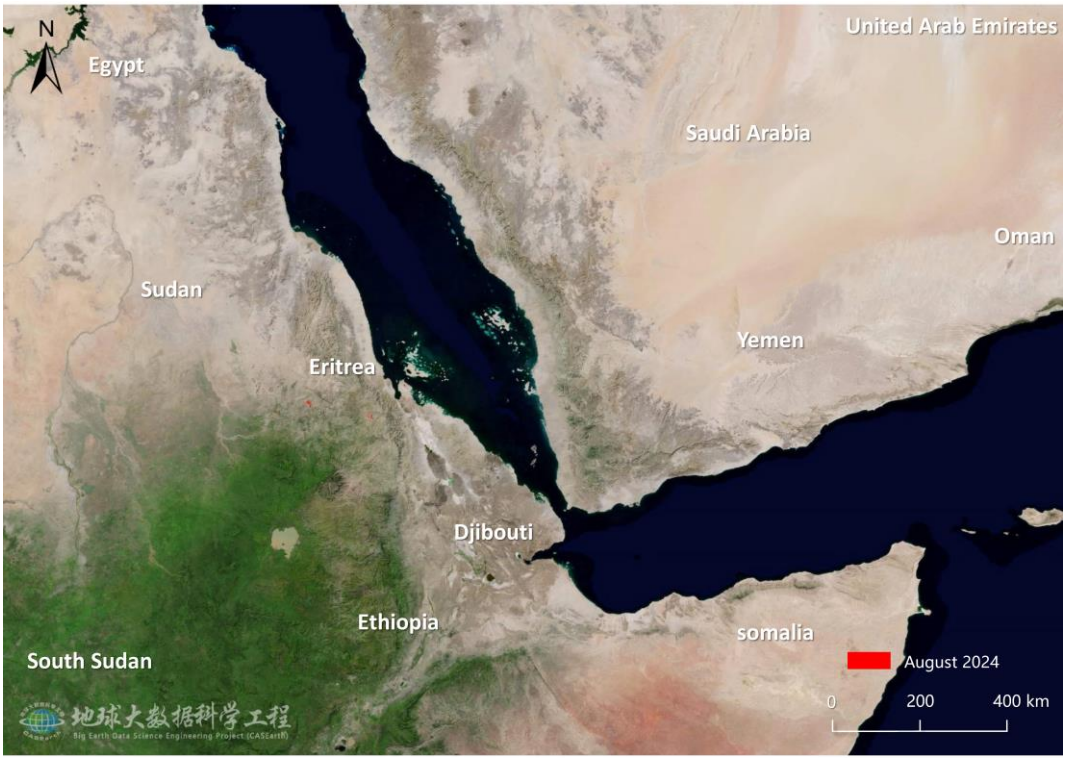

Fig.1 Monitoring of Desert Locust damage in Eritrea (August 2024)

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

In August 2024, abundant rainfall along the Red Sea coast of Saudi Arabia provided favorable conditions for desert locusts to lay eggs and reproduce, leading to an increase in their population. The monitoring results showed that in August, desert locusts damaged 14.0 thousand hectares of vegetation in Saudi Arabia, including 2.2 thousand hectares of farmland, 5.1 thousand hectares of grassland, and 6.7 thousand hectares of shrubland (Figure 2), accounting for 1.01%, 0.26%, and 0.16% of the total area of farmland, grassland, and shrubland, respectively. The Makkah region experienced the most extensive damage, with 5.1 thousand hectares of vegetation affected, followed by the Asīr region, with 4.5 thousand hectares impacted. The Jizan and Al Madinah regions had 2.7 thousand and 1.7 thousand hectares affected, respectively.

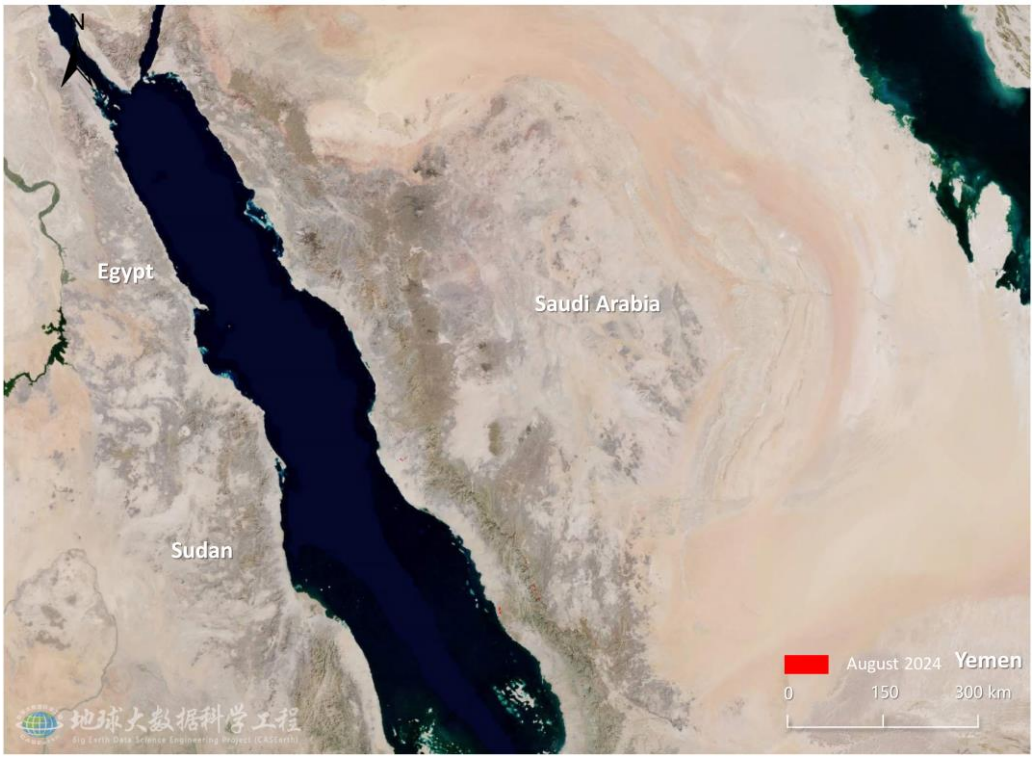

Fig.2 Monitoring of Desert Locust damage in Saudi Arabia (August 2024)

■ 3. Desert Locust Monitoring and Loss Assessment in Yemen

In August 2024, desert locusts were primarily distributed in the western inland regions of Yemen, where abundant rainfall influenced by tropical cyclones and favorable vegetation growth provided conducive conditions for locust oviposition and reproduction. The monitoring results showed that in August, desert locusts damaged 30.3 thousand hectares of vegetation in Yemen, including 9.6 thousand hectares of cropland, 7.9 thousand hectares of grassland, and 12.8 thousand hectares of shrubland (Figure 3), accounting for 1.95%, 0.21%, and 0.24% of the total area of cropland, grassland, and shrubland, respectively. Dhamār experienced the most significant impact, with 13.2 thousand hectares of vegetation affected, followed by Al Hudaydah, with 5.1 thousand hectares. Additionally, the affected areas in Al-Baydā, San'ā, Ta'izz, and Ibb were 3.9 thousand hectares, 3.3 thousand hectares, 2.6 thousand hectares, and 2.2 thousand hectares, respectively.

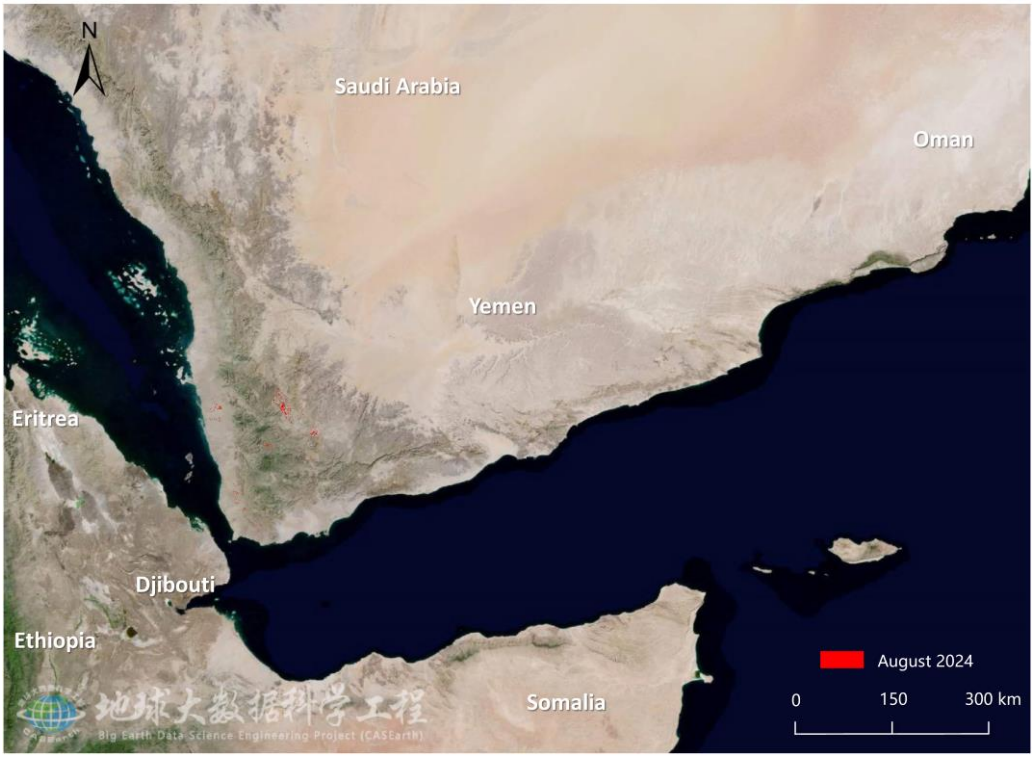

Fig.3 Monitoring of Desert Locust damage in Yemen (August 2024)

The comprehensive analysis suggests that, in the next two months, desert locusts in the western lowlands of Eritrea will lay eggs and reproduce on a small scale, then migrate to the Red Sea coastal areas, where abundant rainfall will occur. Due to increased rainfall from tropical cyclones, favorable vegetation growth in the Red Sea coastal areas of Saudi Arabia and the inland regions of Yemen will support locust oviposition and reproduction, leading to a slight increase in their numbers. Continuous monitoring of desert locust dynamics in Eritrea, Saudi Arabia, and Yemen is essential to prevent repeated losses in crop growth and agricultural production.

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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.

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