



# Report of Monitoring, Early Warning and Assessment of Desert Locust

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## Desert Locust Monitoring and Loss Assessment in Saudi Arabia and Yemen (March 2024)

Integrated with multi-source Earth Observation data, e.g. meteorological data, field data, and remote sensing data (such as the MODIS in the US and SDGSAT-1 in China,), 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 and Yemen. The remote sensing monitoring results showed that, in March 2024, desert locusts were primarily distributed in the western regions of Saudi Arabia and the southwestern regions of Yemen, with areas of vegetation affected reaching 14.3 thousand hectares and 26.4 thousand hectares respectively. It is expected that over the next two months, rainfall will decrease along the coasts of the Red Sea and the Gulf of Aden, leading to drier vegetation conditions unsuitable for the survival and reproduction of desert locusts. As a result, the population of locusts in the western regions of Saudi Arabia and the southwestern regions of Yemen is expected to decrease. Concurrently, due to increased rainfall in the inland areas of Yemen, locust swarms in the southwestern regions of Yemen will migrate inland and undergo minor reproduction, leading to an increase in locust population in the inland areas of Yemen. This period marks the main growing and harvesting seasons for grain crops in Saudi Arabia, as well as the primary planting season for grain crops in Yemen. Continuous attention to the dynamics of the desert locust disaster remains necessary to prevent losses in agricultural and pasture production. The specific research results are as follows.

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

In March 2024, the number of desert locusts within Saudi Arabia decreased due to control measures. The monitoring results showed that in March, the total damaged vegetation area was 14.3 thousand hectares in Saudi Arabia, including 1.7 thousand hectares of cropland, 4.2 thousand hectares of grassland, and 8.4 thousand hectares of shrub (Figure 1), accounting for 0.78%, 0.22%, and 0.21% of the total area of the cropland, grassland, and shrub, respectively. Makkah experienced the most extensive impact, with 7.5 thousand hectares of vegetation affected, followed by Al Bahah, with 5.0 thousand hectares. Additionally, the affected area in Jizan was 1.8 thousand hectares.

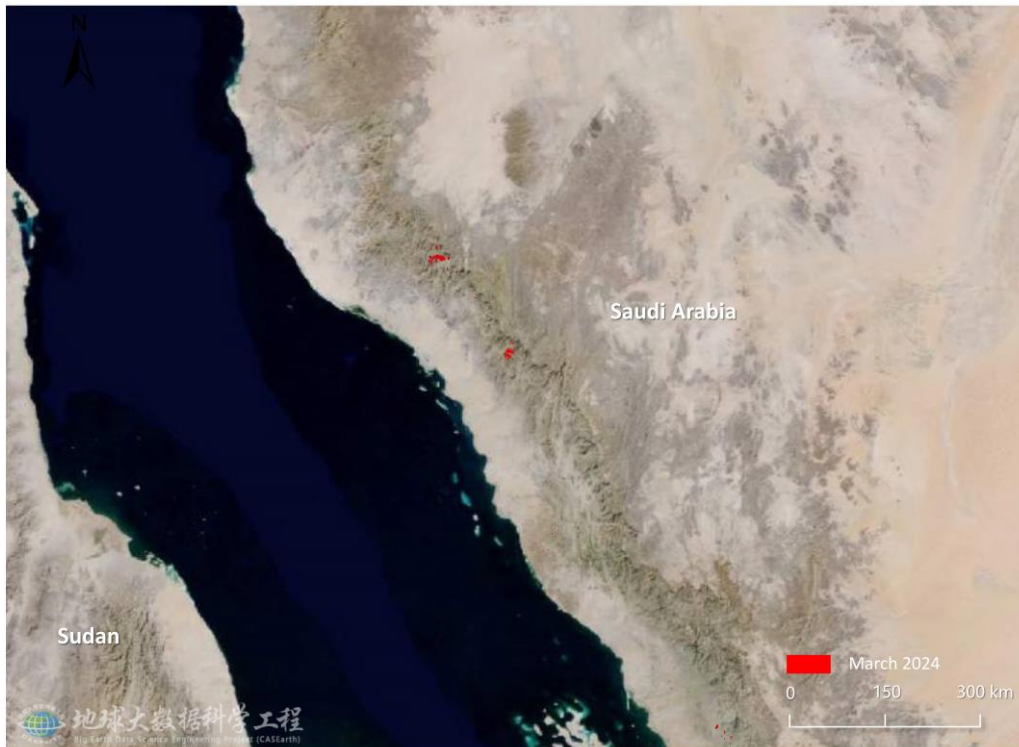


Fig.1 Monitoring of Desert Locust damage in Saudi Arabia (March 2024)

## ■ 2. Desert Locust Monitoring and Loss Assessment in Yemen

In March 2024, desert locusts within Yemen were primarily distributed in the southwestern regions, where reduced precipitation hindered their survival and reproduction. As a result, there was a slight decrease in the number of locusts in that area. The monitoring results showed that in March, the total damaged vegetation area was 26.4 thousand hectares in Yemen, including 4.7 thousand hectares of cropland, 9.4 thousand hectares of grassland, and 12.3 thousand hectares of shrub (Figure 2), accounting for 0.95%, 0.25%, and 0.23% of the total area of the cropland, grassland, and shrub, respectively. Ta'izz experienced the most extensive impact, with 9.4 thousand hectares of vegetation affected, followed by Dhamār, with 5.6 thousand hectares. Additionally, the affected areas in Al Hudaydah, Al Mahrah, Al Baydā, Lahij and Abyān provinces were 3.5, 2.6, 2.1, 1.8 and 1.4 thousand hectares, respectively.



Fig.2 Monitoring of Desert Locust damage in Yemen (March 2024)

This study simultaneously utilized SDGSAT-1 satellite remote sensing data to monitor disaster situations in severely affected areas of southwestern Yemen (Figure 3). Region 1 is located in the southwestern part of Dhamar province, 34.7 kilometers west of Zabid and 19.4 kilometers northeast of Parifa. Region 2 is situated in the central part of Ta'izz province, 18.1 kilometers west of Al Hababi and 37.5 kilometers northeast of Al Faraha. The total vegetation area in Region 1 is 30.75 thousand hectares, with shrubland being the primary affected type. The affected area is 2.67 thousand hectares, accounting for 8.71% of the total shrubland area in this region. The total vegetation area in Region 2 is 33.14 thousand hectares, with a total affected vegetation area of 4.55 thousand hectares. Among them, the affected areas of farmland and shrubland are 0.79 thousand hectares and 3.76 thousand hectares, respectively, accounting for 15.52% and 13.42% of the total grassland and shrubland area in this region.

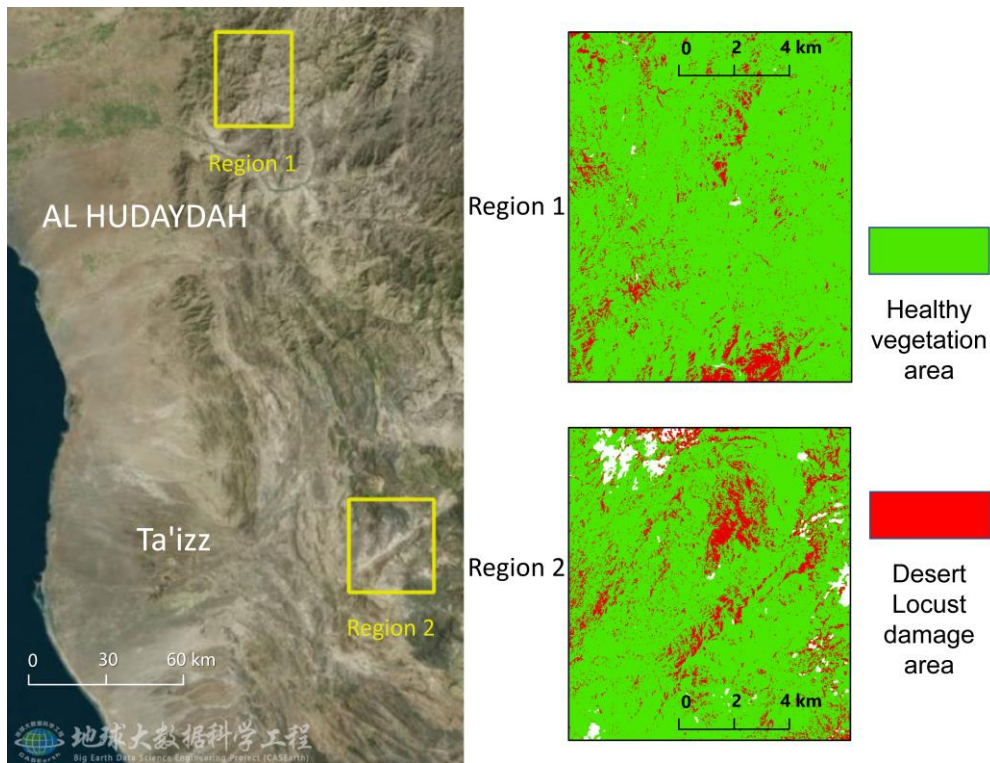


Fig.3 Monitoring of Key Desert Locust Infestation Areas in Yemen Based on SDGSAT-1 Imagery (March 2024)

The comprehensive analysis shows that, in the next two months, rainfall will decrease along the coasts of the Red Sea and the Gulf of Aden, leading to drier vegetation conditions unsuitable for the survival and reproduction of desert locusts. As a result, the population of locusts in the western regions of Saudi Arabia and the southwestern regions of Yemen is expected to decrease. Concurrently, due to increased rainfall in the inland areas of Yemen, locust swarms in the southwestern regions of Yemen will migrate inland and undergo minor reproduction, leading to an increase in locust population in the inland areas of Yemen. This period marks the main growing and harvesting seasons for grain crops in Saudi Arabia, as well as the primary planting season for grain crops in Yemen. Continuous attention to the dynamics of the desert locust disaster in Saudi Arabia and Yemen remains necessary to prevent repeated losses in agricultural and pasture 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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