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Crop pests and diseases monitoring and forecasting Global

April to May 2020

Pests will occur heavier than diseases on winter wheat

Affected areas are estimated to reach 30 million ha

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 crop pest and disease monitoring and forecasting, the research team constructed the 'Crop pests and diseases monitoring and forecasting system', which could regularly release thematical maps and reports on main crop pests and diseases at global scale.

During April to May 2020, pest will occur heavier than disease in eleven main winter wheat production countries, including Russia, China, United States, Pakistan, France, Turkey, Iran, Germany, Canada, Uzbekistan and United Kingdom. The total areas affected by wheat rust

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(*Puccinia striiformis*) and aphid (*Sitobion avenae* & *Rhopalosiphum padi*) are estimated to reach 30 million hectares.

Wheat rust

The distribution, occurrence area and ratio of wheat rust in eleven main wheat production countries is shown in Figure 1 and Table 1. The wheat planted area of Russia is 27 million hectares, the total affected areas of rust are estimated to reach 232 ten thousand hectares, accounting for 9% of the total planting area, will mainly occur in Caucasus and central region. The wheat planted area of China is 24 million hectares, the total affected areas of rust are

estimated to reach 243 ten thousand hectares, accounting for 10% of the total planting area, will mainly occur in southwest, northwest and central China. The wheat planted area of the United States is 18 million hectares, the total affected areas of rust are estimated to reach 41 ten thousand hectares, accounting for 2% of the total planting area, will mainly occur in the northwest of the United States and the west of the Great Plains. The wheat planted area of Pakistan is 9 million hectares, the total affected areas of rust are estimated to reach 69 ten thousand hectares, accounting for 8% of the total planting area, will mainly occur in northern plateau and northern Punjab. The wheat planted area of France is 7 million hectares, the total affected areas of rust are estimated to reach 80 ten thousand hectares, accounting for 11% of the total planting area, will mainly occur in mixed maize/barley and rapeseed zone of southwest region. The wheat planted area of Turkey is 7 million hectares, the total affected areas of rust are estimated to reach 35 ten thousand hectares, accounting for 5% of the total planting area, will mainly occur in eastern region. The wheat planted area of Iran is 7 million hectares, the total affected areas of rust are estimated to reach 68 ten thousand hectares,

accounting for 10% of the total planting area, will mainly occur in central and southern region. The wheat planted area of Germany is 5 million hectares, the total affected areas of rust are estimated to reach 88 ten thousand hectares, accounting for 18% of the total planting area, will mainly occur in wheat zone of mixed wheat and sugar beets zone of the north-west, western sparse crop area of the Rhenish massif, and central wheat zone of Saxony and Thuringia. The wheat planted area of Canada is 4 million hectares, the total affected areas of rust are estimated to reach 33 ten thousand hectares, accounting for 8% of the total planting area, will mainly occur in southern region. The wheat planted area of Uzbekistan is 2 million hectares, the total affected areas of rust are estimated to reach 26 ten thousand hectares, accounting for 13% of the total planting area, will mainly occur in the western regions of eastern hilly cereals zone. The wheat planted area of United Kingdom is 2 million hectares, the total affected areas of rust are estimated to reach 16 ten thousand hectares, accounting for 8% of the total planting area, will mainly occur in south English mixed wheat and Barley zone.

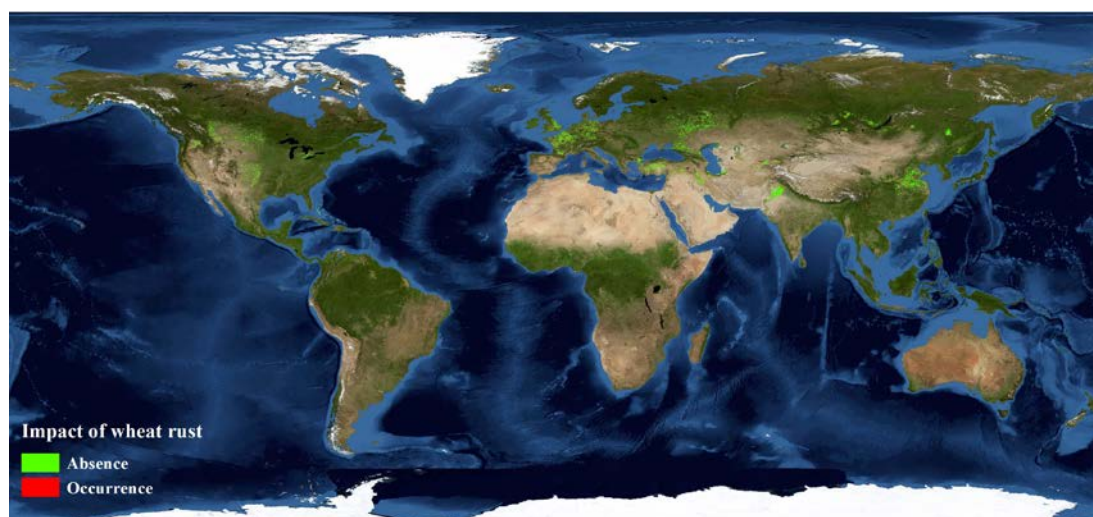


Figure 1 Spatial distribution of wheat rust in eleven winter wheat production countries

Wheat aphid

The distribution, occurrence area and ratio of wheat aphid in eleven main wheat production countries is shown in Figure 2 and Table 1. The total affected areas of aphid in Russia are estimated to reach 358 ten thousand hectares, accounting for 13% of the total planting area, will mainly occur in the Caucasus and Volga Basin. The total affected areas of aphid in China are estimated to reach 755 ten thousand hectares, accounting for 31% of the total planting area, will mainly occur in north China and central China. The total affected areas of aphid in United States are estimated to reach 285 ten thousand hectares, accounting for 16% of the total planting area, will mainly occur in northwest of the Great Plain. The total affected areas of aphid in Pakistan are estimated to reach 230 ten thousand hectares, accounting for 26% of the total planting area, will mainly occur in northern plateau, northern Punjab and lower Indus. The

total affected areas of aphid in France are estimated to reach 68 ten thousand hectares, accounting for 10% of the total planting area, will mainly occur in mixed maize/barley and rapeseed zone of northwest region. The total affected areas of aphid in Turkey are estimated to reach 88 ten thousand hectares, accounting for 13% of the total planting area, will mainly occur in northwest region close to Marmara Sea. The total affected areas of aphid in Iran are estimated to reach 174 ten thousand hectares, accounting for 25% of the total planting area, will mainly occur in southeast and central region. The total affected areas of aphid in Germany are estimated to reach 53 ten thousand hectares, accounting for 11% of the total planting area, will mainly occur in central wheat zone of Saxony and Thuringia. The total affected areas of aphid in Canada are estimated to reach 45 ten thousand hectares, accounting for 11% of the total planting area, will mainly occur in

southern region. The total affected areas of aphid in Uzbekistan are estimated to reach 40 ten thousand hectares, accounting for 20% of the total planting area, will mainly occur in eastern hilly cereals zone. The total affected areas of

aphid in United Kingdom are estimated to reach 14 ten thousand hectares, accounting for 7% of the total planting area, will mainly occur in south English mixed wheat and Barley zone.

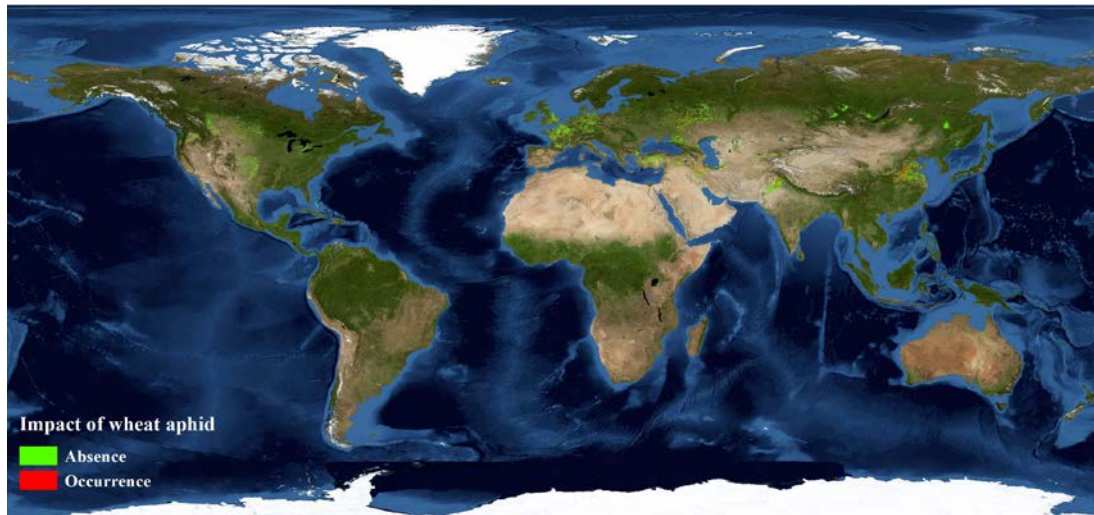


Figure 2 Spatial distribution of wheat aphid in eleven winter wheat production countries

Table 1 Statistics of wheat rust and aphid in eleven winter wheat production countries

| Winter wheat production countries | Rust occurrence area and ratio | | Aphid occurrence area and ratio | | Total planting area / million hectares |
|-----------------------------------|--------------------------------|-----------|---------------------------------|-----------|--|
| | Area / ten thousand hectares | Ratio / % | Area / ten thousand hectares | Ratio / % | |
| Russia | 232 | 9 | 358 | 13 | 27 |
| China | 243 | 10 | 755 | 31 | 24 |
| United States | 41 | 2 | 285 | 16 | 18 |
| Pakistan | 69 | 8 | 230 | 26 | 9 |
| France | 80 | 11 | 68 | 10 | 7 |
| Turkey | 35 | 5 | 88 | 13 | 7 |
| Iran | 68 | 10 | 174 | 25 | 7 |
| Germany | 88 | 18 | 53 | 11 | 5 |
| Canada | 33 | 8 | 45 | 11 | 4 |
| Uzbekistan | 26 | 13 | 40 | 20 | 2 |
| United Kingdom | 16 | 8 | 14 | 7 | 2 |

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The Crop Pests and Diseases Monitoring and
Forecasting system are available under:
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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.

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