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Crop pests and diseases monitoring and forecasting in China

2020

Severe infestation of pests and diseases on wheat

Affected area is estimated to be 16.3 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, AIR (RADI) constructed the 'Crop pests and diseases monitoring and forecasting system', which could regularly release thematical maps and reports on main crop pests and diseases in whole China.

In 2020, due to the higher temperature and precipitation with previous years, and the more basic number of main pests and diseases before winter, pests and diseases are severely occurred in winter wheat regions of China. The total area affected by wheat yellow rust (*Puccinia striiformis*), sheath blight (*Rhizotonia cerealis*), fusarium head blight (*Fusarium graminearum*) and aphid (*Sitobion avenae* & *Rhopalosiphum padi*) is estimated to be 16.3 million hectares.

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Review of meteorological conditions

The national average temperature in January of 2020 was 1.3 °C higher than in previous years. Meteorological conditions in these areas were conducive to the overwintering and occurrence of wheat pests and diseases.

In the spring of 2020, more precipitation in Jiangnan, Jianghuai, and Huanghuai, while central Jiangsu, central Anhui, southern Henan, and most of Hubei are more than 20-50% than previous years, this will increase the occurrence and development of wheat pests and diseases.

Wheat yellow rust

In 2020, the occurrence of yellow rust is estimated to be 2.5 million hectares, mainly in North China, Central China, and Northwest China. The specific distributions and severities are shown in Figure 1 and Table 1.

Specifically, the yellow rust is estimated to be occurred mainly in Gansu, Shaanxi, Sichuan, Hubei, Henan, Shandong.

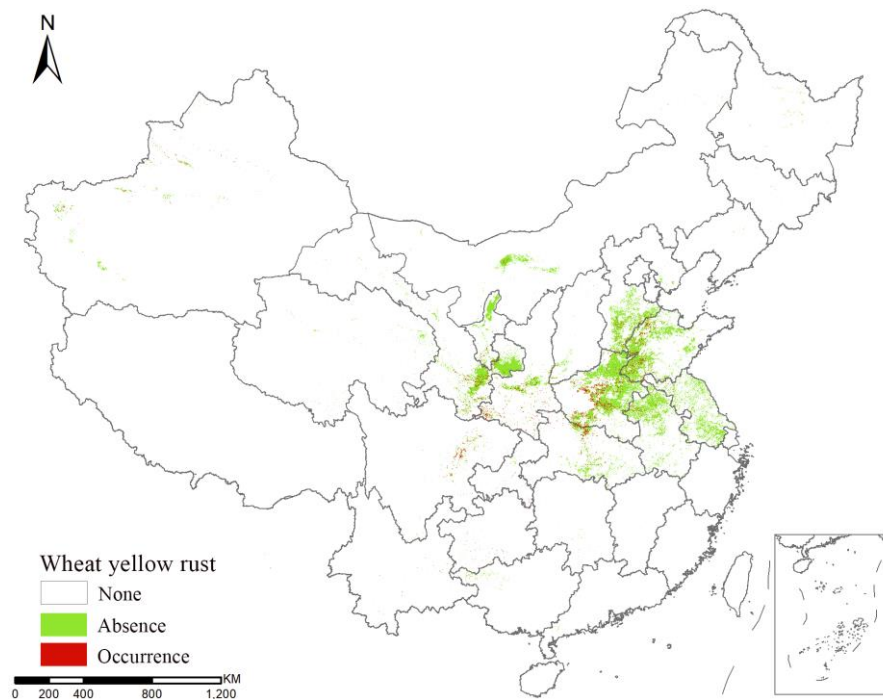


Figure 1 Spatial distribution of wheat yellow rust in China (2020)

Table 1 Statistics of wheat yellow rust in China (2020)

Region	Area / Ten thousand hectare			
	Absence	Occurrence	Total area	Occurrence ratio/%
Northeast China	11.2	0.0	11.2	0
North China	328.4	17.8	346.2	5
East China	896.7	50.3	947.0	5
South China	0.3	0.0	0.3	0
Central China	581.2	107.3	688.5	16
Northwest China	237.5	56.9	294.4	19
Southwest China	103.1	19.0	122.1	16
Total	2158.3	251.2	2409.5	10

Wheat sheath blight

In 2020, the occurrence of sheath blight is estimated to be 6.0 million hectares, with the disease mainly in Central China and East China. The specific distributions and severities are shown in Figure 2 and Table 2.

Specifically, the sheath blight is estimated to be occurred mainly in Henan, Shandong, Anhui, Hubei and Jiangsu.

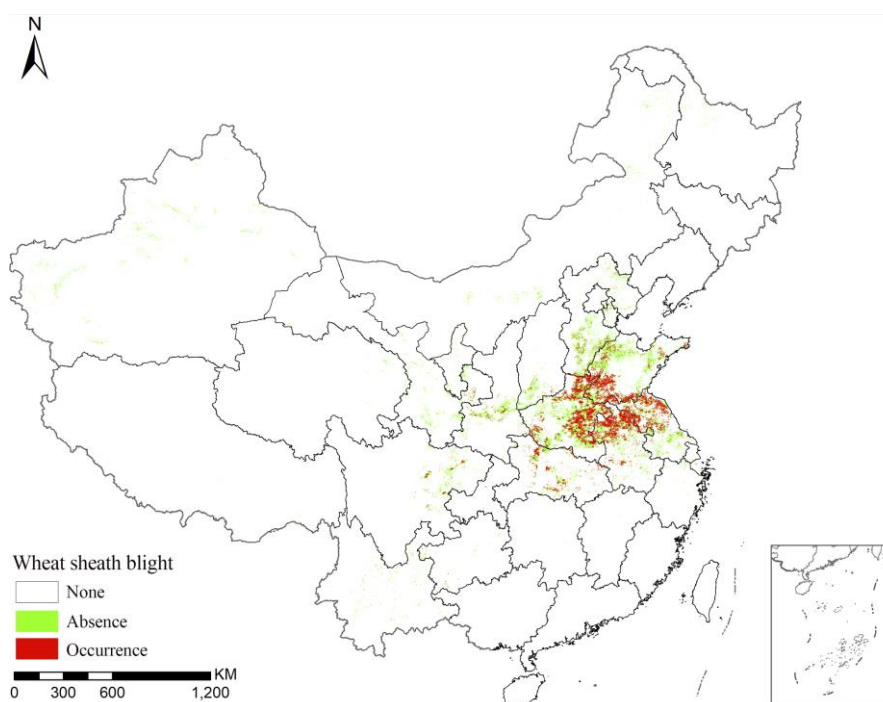


Figure 2 Spatial distribution of wheat sheath blight in China (2020)

Table 2 Statistics of wheat sheath blight in China (2020)

Region	Area / Ten thousand hectare			
	Absence	Occurrence	Total area	Occurrence ratio/%
Northeast China	11.2	0.0	11.2	0
North China	312.1	34.1	346.2	10
East China	612.9	334.1	947.0	35
South China	0.3	0.0	0.3	0
Central China	466.9	221.5	688.4	32
Northwest China	275.6	18.8	294.4	6
Southwest China	104.1	18.0	122.1	15
Total	1783.1	626.4	2409.5	26

Wheat fusarium head blight

In 2020, the occurrence of Fusarium head blight is estimated to be 0.5 million hectares, mainly in East China and Central China. The specific distributions and severities are shown in Figure 3 and Table 3.

Specifically, the Fusarium head blight is estimated to be occurred mainly in Anhui, Jiangsu, Hubei.

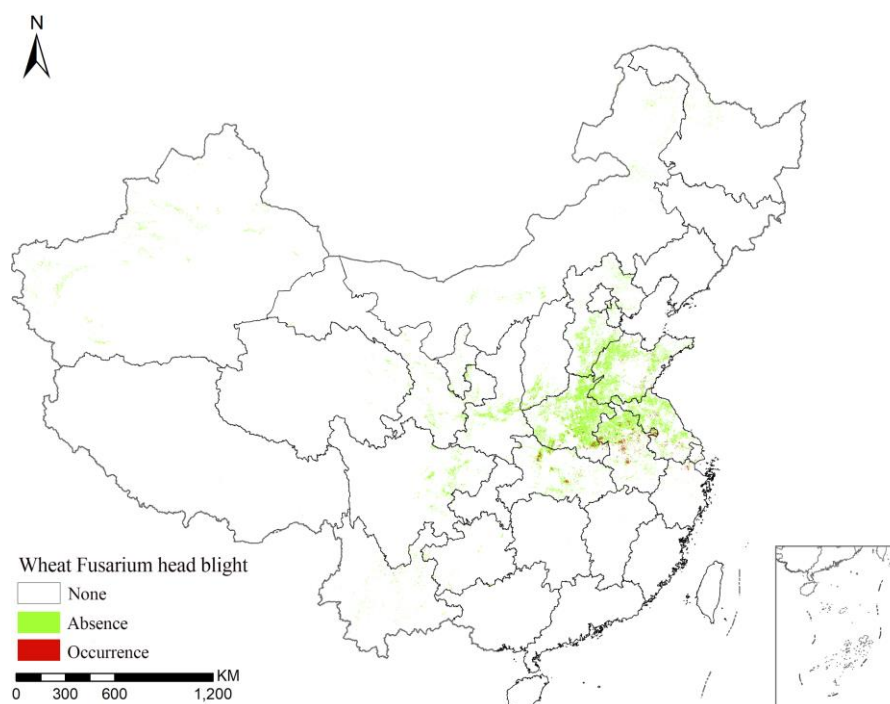


Figure 3 Spatial distribution of wheat fusarium head blight in China (2020)

Table 3 Statistics of wheat fusarium head blight in China (2020)

Region	Area / Ten thousand hectare			
	Absence	Occurrence	Total area	Occurrence ratio/%
Northeast China	11.2	0.0	11.2	0
North China	344.3	1.9	346.2	1
East China	917.4	29.6	947.0	3
South China	0.3	0.0	0.3	0
Central China	671.6	16.9	688.5	2
Northwest China	293.8	0.6	294.4	0
Southwest China	121.6	0.5	122.1	0
Total	2360.0	49.5	2409.5	2

Wheat aphid

In 2020, the occurrence of aphid is estimated to be 7.0 million hectares, mainly in East China, North China and Central China. The specific distributions and severities are shown in Figure 3 and Table 3.

Specifically, the aphid is estimated to be occurred mainly in Henan, Shandong, Hebei, Anhui and Jiangsu.

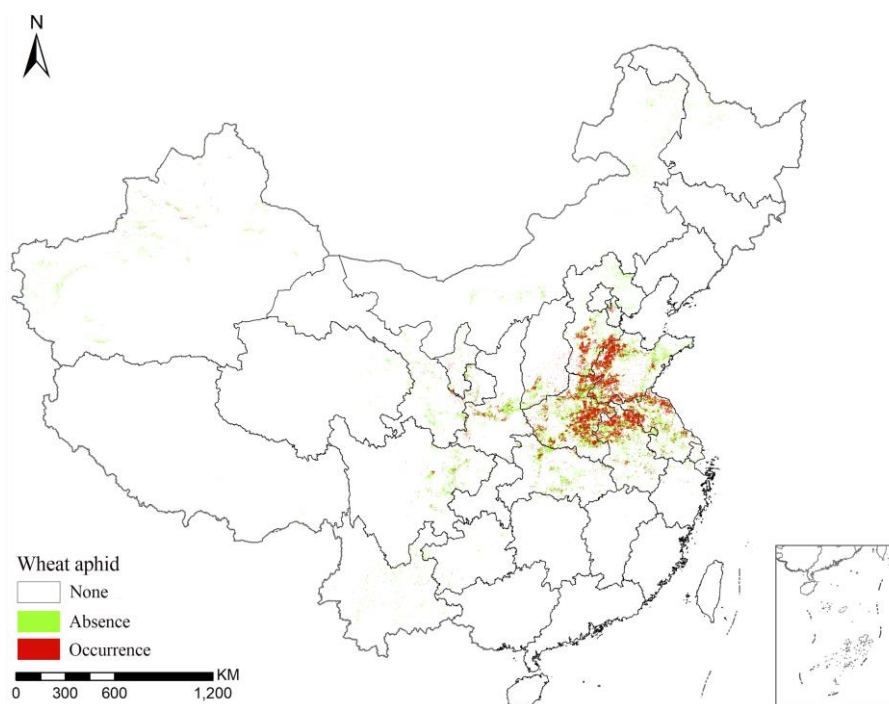


Figure 4 Spatial distribution of wheat aphid in China (2020)

Table 4 Statistics of wheat aphid in China (2020)

Region	Area / Ten thousand hectare			
	Absence	Occurrence	Total area	Occurrence ratio/%
Northeast China	11.2	0.0	11.2	0
North China	266.2	80.0	346.2	23
East China	592.6	354.4	947.0	37
South China	0.3	0.0	0.3	0
Central China	469.3	219.1	688.4	32
Northwest China	253.9	40.4	294.3	14
Southwest China	111.0	11.0	122.0	9
Total	1704.6	704.9	2409.5	29

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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.

Supported by the Strategic Priority Research Program of the Chinese Academy of Sciences (XDA19080304), National Key R&D Program of China (2017YFE0122400, 2016YFB0501501), National Natural Science Foundation of China (61661136004, 41801338, 41801352, 41871339), Beijing Nova Program of Science and

Technology (Z191100001119089), Science and Technology Service program of Chinese Academy of Sciences (KFJ-STS-ZDTP-054), National special support program for high-level personnel recruitment (Wenjiang Huang), and Youth Innovation Promotion Association CAS (2017085).

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