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Crop pests and diseases monitoring and forecasting in China

Medium infestation of pests and diseases on wheat in 2019

Affected area reached 13.5 million ha in China

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 2019, due to the lower temperature and higher precipitation than previous years, pest and disease are moderately occurred in winter wheat regions of China. The total area affected by wheat yellow rust (*Puccinia striiformis*), sheath blight (*Rhizotonia cerealis*), aphid (*Sitobion avenae* & *Rhopalosiphum padi*), and Fusarium head blight (*Fusarium graminearum*) has reached 13.5 million hectares.

Review of meteorological conditions

Content

Overview	1
Wheat yellow rust	2
Wheat sheath blight	3
Wheat aphid	4
Wheat Fusarium head blight	5
Contact us	6

Field temperature is higher than previous years. From April to May, maximum of the averaged field temperature in winter wheat regions of China reached 25.0 °C, which is 1.2 °C higher than previous years.

Field precipitation from April to May is higher than previous years. According to the rainfall process in western regions of Northeast China, North China, and central regions of South China, field humidity reached a suitable level for pests and diseases development.

Wheat yellow rust

In 2019, the occurrence of yellow rust reached 0.7 million hectares. The disease first appeared in Jiangnan, Jianghuai, the southern regions of Huanghuai, Southwest China and Northwest China in early April. The full

incidence period was during mid-late April to mid-May, and then the disease has spread to Northwest China, Jianghuai, and Huanghuai. The specific distributions and severities are shown in Figure 1 and Table 1.

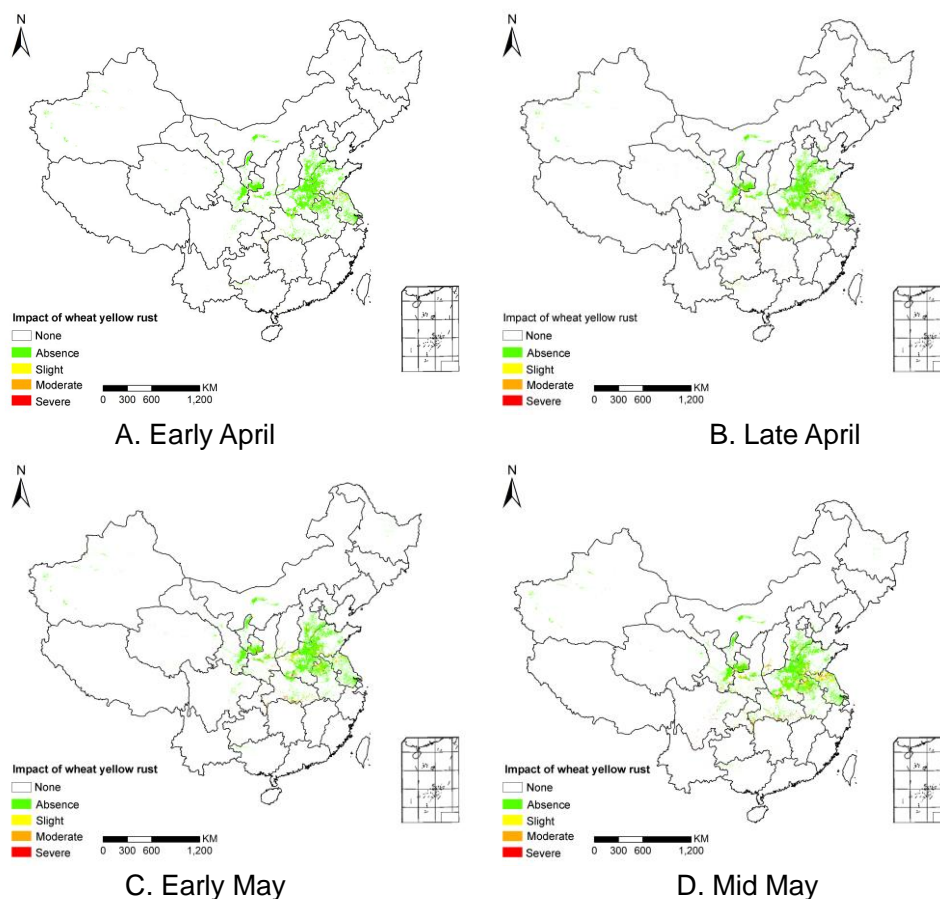


Figure 1 Spatial distribution of wheat yellow rust in China (2019)

Table 1 Statistics of wheat yellow rust in China (2019)

Region	Area / Thousand hectare				
	Early April	Late April	Early May	Mid May	Total area
Northeast China	0	0	0	0	85.3
North China	17.9	37.3	76	82	3579.3
East China	56.7	111.3	198.7	242.7	8556
South China	0	0	0	0	16.7
Central China	44.1	87.3	157.3	188	6710
Northwest China	22.7	45.3	82.7	96.7	3376
Southwest China	12.7	23.4	34.7	50	1828.7
Total	154.1	304.6	549.4	659.4	24152

Wheat sheath blight

In 2019, the occurrence of sheath blight reached 6.0 million hectares. The disease first appeared in Jiangnan plain, Jianghuai and Huanghuai in early April. And mainly occurred in Huanghuai, North China, and Southwest China during mid to late April. Then, the full

incidence period was in mid-May, which mainly in Southwest China, Jianghuai and Huanghuai, and slightly occurred in Northwest China and Southwest China. The specific distributions and severities are shown in Figure 2 and Table 2.

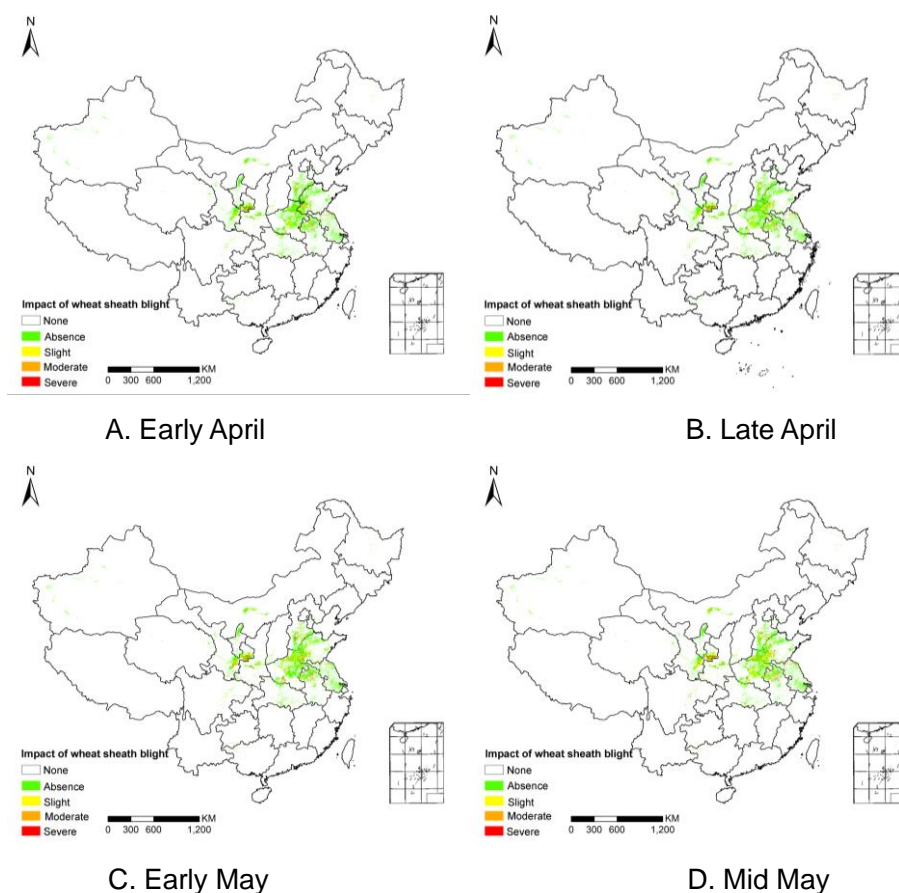


Figure 2 Spatial distribution of wheat sheath blight in China (2019)

Table 2 Statistics of wheat sheath blight in China (2019)

Region	Area / Thousand hectare				
	Early April	Late April	Early May	Mid May	Total area
Northeast China	4.6	6	6	9.3	85.3
North China	461.3	533.3	762	793.3	3579.3
East China	1325.3	1519.3	1978	2189.3	8556
South China	2.7	2.7	4	4	16.7
Central China	1028	1186.7	1552	1729.3	6710
Northwest China	528.6	606.7	797.3	882.7	3376
Southwest China	273.4	310	343.4	438.7	1828.7
Total	3623.9	4164.7	5442.7	6046.6	24152

Wheat aphid

In 2019, the occurrence of aphid reached 6.5 million hectares. The pest first appeared in the northern regions of Central China, the southern regions of North China, the eastern regions of Northwest China and part of

Huanghuai in early April. The full incidence period was in mid-May, which mainly in Huanghuai and the eastern regions of Northwest China. The specific distributions and severities are shown in Figure 3 and Table 3.

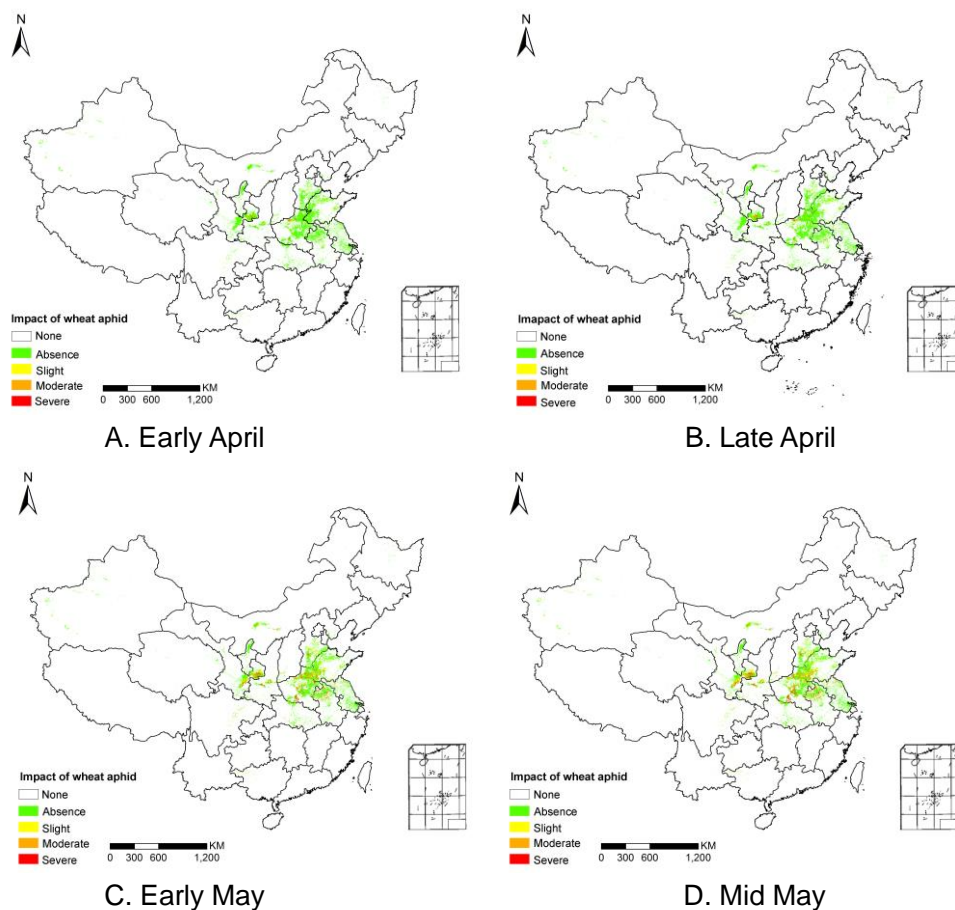


Figure 3 Spatial distribution of wheat aphid in China (2019)

Table 3 Statistics of wheat aphid in China (2019)

Region	Area / Thousand hectare				
	Early April	Late April	Early May	Mid May	Total area
Northeast China	2.1	2.6	6	8	85.3
North China	194	247.3	819.3	904.6	3579.3
East China	507.3	645.3	2130.7	2354	8556
South China	1.4	1.4	4	4.7	16.7
Central China	394.7	505.3	1668.7	1850.7	6710
Northwest China	202.7	259.3	854	944.7	3376
Southwest China	92.7	117.4	367.4	409.4	1828.7
Total	1394.9	1778.6	5850.1	6476.1	24152

Wheat Fusarium head blight

In 2019, the occurrence of Fusarium head blight reached 0.3 million hectares. The disease first appeared in middle and lower reaches of Yangtze River and Jianghuai in late April. Then, the full incidence period was during early to mid-May, and the disease has

spreaded to middle and lower reaches of Yangtze River, Jianghuai and the southern regions of Huanghuai. The specific distributions and severities are shown in Figure 4 and Table 4.

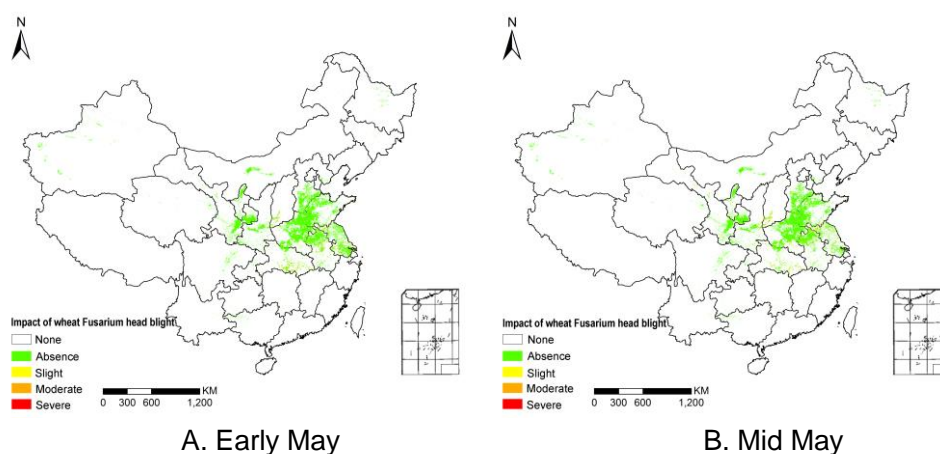


Figure 4 Spatial distribution of wheat Fusarium head blight in China (2019)

Table 4 Statistics of wheat Fusarium head blight in China (2019)

Region	Area / Thousand hectare		
	Early May	Mid May	Total area
Northeast China	0	0	85.3
North China	22	32.7	3579.3
East China	160.7	168.7	8556
South China	0	0	16.7
Central China	108.7	118	6710
Northwest China	25.3	27.3	3376
Southwest China	0	0	1828.7
Total	316.7	346.7	24152

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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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