

Forecasts on Crop Pests and Diseases in China

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1. Introduction

China is a country threatened by serious biological disasters, where all kinds of pests and diseases on crops have occurred heavily and frequently. Especially due to the influence of global climate change and other factors in recent years, it has been under attack by pests such as *Spodoptera frugiperda* and *Schistocerca gregaria*, as well as rice planthopper; and diseases such as wheat stripe rust, southern rice black-streaked dwarf disease and rice ragged stunt. After years of scientific control, China has managed to reduce the occurrence of pests and diseases on crops in general. According to the National Agro-tech Extension and Service Centre (NATESC), the annual occurrence areas of pests, diseases, weeds and rodents in 2017–2022 were between 400 million ha and 437 million ha collectively.

In China, pests and diseases on three major crops (wheat, rice and corn) in 2022 were under effective control, as data show the loss ratio was down 0.19 percentage point to 4% in the year. The overall occurrence area of three major corn pests (*Spodoptera frugiperda*, armyworm and corn borer) and two diseases (southern corn rust and northern leaf blight) in 2023 is estimated to be up by 20.8% year on year.

In this report, CCM will provide the overview of occurrence, control and yield loss of crops resulted by pests, diseases, weeds and rodents in 2012-2022, as well as forecasts on the occurrence of pests and diseases in China in 2023 from the following aspects:

- ✓ Wheat
- ✓ Rice
- ✓ Corn

2. Methodology

The report is drafted by diverse methods as follows:

- Desk research

The sources of desk research are various, including published magazines, journals, government websites and statistics, industrial statistics, association seminars as well as information from the Internet. A lot of work has gone into the compilation and analysis of the obtained information.

- Internet

CCM visited government websites and contacted with players in the domestic agrochemical industry through B2B websites and software as well as obtained registration information on the internet.

- Data processing and presentation

The data collected and compiled are sourced from:

- CCM's database
- Published articles in periodicals, magazines, journals and third-party databases
- Statistics from governments and international institutes
- Telephone interviews with domestic producers, joint ventures, service suppliers and governments
- Third-party data providers
- Comments from industrial experts
- Professional databases from other sources
- Information from the internet

The data from various sources have been combined and cross-checked to make this report as precise and scientific as possible. Throughout the process, a series of internal discussions were held in order to analyse the data and draw the conclusions.

3. Executive summary

In China, the average annual occurrence area of pests, diseases, weeds and rodents in 2017–2022 stayed above XX million ha. But it was down by XX compared with data averaged in 2012–2016. In particular, pests and diseases on three major crops (wheat, rice and corn) in 2022 were under effective control, as data show the loss ratio was down XX percentage point to XX in the year.

Based on comprehensive analysis of previous occurrence of pests and diseases, crop distribution, planting methods, climatic trend and other factors, it is predicted that the Class-I crop pests (including XX main kinds of pests) and diseases (including XX main kinds of diseases) will occur heavily in China in 2023 on main crops such as wheat, rice, corn, potato, etc., with a nationwide occurrence area of XX million ha, threatening more than XX million tonnes of annual yield on grain crops, an increase of XX year on year.

For 2023, the overall occurrence area of other major quarantine pests and diseases is expected to decrease by XX compared with the 2022 level and the occurrence area of the other grain crops' pests and diseases will reach XX million ha.

4. What's in this report?

Note: Key data/information in this sample page is hidden, while in the report it is not.

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1 Overview

1.1 Occurrence, control and yield loss of crops resulted by pests, diseases, weeds and rodents, 2012-2022

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Data from NATESC and National Bureau of Statistics (NBS) show that in 2022 the total occurrence area of pests, diseases, weeds and rodents was XX million ha, while the control area totaled over XX million ha in China retrieving loss of up to XX million tonnes (=XX of the total grain yield in 2022). The average annual occurrence area of pests, diseases, weeds and rodents in 2012–2022 was XX million ha: in 2017–2022, the annualised occurrence area was XX ha, down by XX compared with the annualised number in 2012–2016.

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Table 1.1-1 Occurrence area, control area and yield loss of crops resulted from pests, diseases, weeds and rodents in China, 2012-2022

| Year | Occurrence area, million ha | Control area, million ha | Retrieved loss, million tonne | Actual loss, million tonnes | Yield, million tonnes | Ratio of retrieved loss to yield | Ratio of actual loss to yield |
|----------------|-----------------------------|--------------------------|-------------------------------|-----------------------------|-----------------------|----------------------------------|-------------------------------|
| 2012 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2013 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2014 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2015 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2016 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2017 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2018 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2019 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2020 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2021 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2022 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| Average | XXX | XXX | XXX | XXX | XXX | XXX | XXX |

Source: NATESC & NBS

1.2 Occurrence of pests and diseases on three major crops in China, 2017–2022

Based on the analysed results of the pest and disease base numbers before winter, crops and meteorological conditions, and other influencing factors, the NATESC outlined the occurrence of major crop pests and diseases in China in 2022, showing a lessened hit by pests and diseases on three main crops (wheat, rice and corn), compared with the results in the previous year:

1. XXXXXX
2. XXXXXX
3. XXXXXX
4. XXXXXX

Table 1.2-1 Occurrence area, control area and yield loss of wheat pests and diseases in China, 2017–2022

| Year | Occurrence area, million ha | Control area, million ha | Retrieved loss, million tonnes | Actual loss, million tonnes | Yield, million tonnes | Ratio of retrieved loss to yield | Ratio of actual loss to yield |
|----------------|-----------------------------|--------------------------|--------------------------------|-----------------------------|-----------------------|----------------------------------|-------------------------------|
| 2017 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2018 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2019 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2020 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2021 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| 2022 | XXX | XXX | XXX | XXX | XXX | XXX | XXX |
| Average | XXX | XXX | XXX | XXX | XXX | XXX | XXX |

Source: NATESC & NBS

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2 Review on control of pests and diseases on major crops in China, 2022

- Overall occurrence area of pests, diseases, weeds and rodents in 2022

According to the National Agro-tech Extension and Service Centre (NATESC), totaling XX million ha of occurrence area of pests, diseases, weeds and rodents was recorded in 2022. Among them, three major crops (wheat, rice and corn) faced varied levels of occurrence of pests and diseases in China in 2022, accounting for XX of the total.

2.1 Occurrence of major pests and diseases on wheat in China

The control area of pests, diseases, weeds and rodents on wheat in 2022 was XX million ha, retrieving about XX million tonnes of wheat from potential threats. The occurrence of pests, diseases, weeds and rodents on wheat in China was moderate overall in 2022, despite some serious hits by pests and diseases in some regions.

The autumn of 2022 with high temperatures and precipitation in the most parts of China's winter wheat-growing areas, saw the good growth of wheat. But Chinese winter wheat varieties feature low resistance to diseases such as wheat scab, wheat stripe rust, powdery mildew, wheat sheath blight and stem rot, etc. NATESC expects a serious occurrence of major crop pests and diseases in China for 2023, especially for *Spodoptera frugiperda*, rice planthopper and rice leaf rollover, *Chilo suppressalis*, wheat scab and aphid, etc.

Wheat scab: Varied fungi have deep-rooted in wheat-growing regions in the middle-lower reaches of the Yangtze, Jiang-Huai and Huang-Huai rivers and started to spread eastward and northward in recent years, as Chinese farmers have started to grow corn and/or rice crops in a rotation on most wheat-growing areas, supporting reproduction and accumulation of the wheat scab-related fungus.

Wheat stripe rust: ...

Powdery mildew: ...

Wheat sheath blight: ...

Aphid: ...

Brown wheat mite: ...

Wheat midge: ...

3 Forecasts on pests and diseases of major crops in China in 2022

China's State Council released the regulation on the prevention and control of pests and diseases affecting crops, which came into effect on XX. In particular, China classifies crop pests and diseases into three classes by the characteristics of crop pests and diseases and their degree of harm to agricultural production. The Class-I crop pests (mainly XX kinds of pests) and diseases (mainly XX kinds of diseases) in China refer to crop pests and diseases that occur in a particularly large area or may cause significant losses to agricultural production throughout the year.

3.1 Forecasts of major pests and diseases on wheat in China in 2022

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3.2 Forecasts of major pests and diseases on rice

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3.3 Forecasts of major pests and diseases on corn

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