



International Trade Brings Biosecurity Challenges in China

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DR. Wang, Shuping

General Administration of Customs, P. R. China

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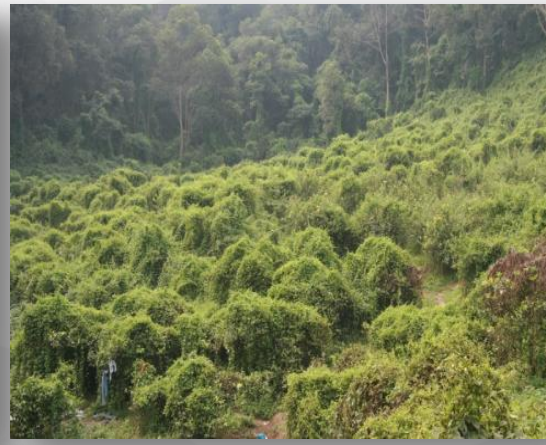
01

Plant Pest Invasion Issues In China

➤ Plant super killer -- *Mikania*



Mile-a-minute, Species death/escape, disappearance/extinction in the covered area.



➤ Plant super killer -- *Mikania*



➤ Life-threatening Red fire ant (*Solenopsis invicta* Buren)



被红火蚁咬后的症状



➤ Cross-border E-commerce brings new and unexpected challenges

Cross-border E-commerce: Accelerate the Invasion of Plant Pest

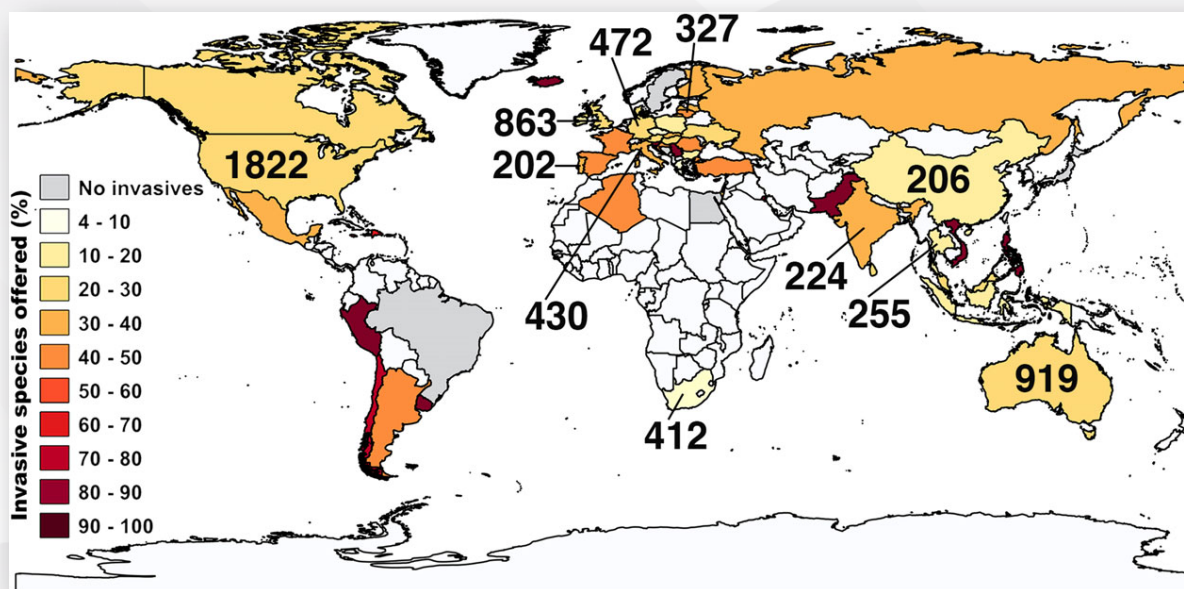


Figure 2. The 65 countries (or overseas territories) where plant species were offered on eBay.com and the percentage of invasive species among those offered (grey, no invasive species; yellow to red, increasing percentage of invasive species). The total number of species sold from a country is indicated when this number is >200.





Global threat to agriculture from invasive species

Dean R. Paini^{a,b,1}, Andy W. Sheppard^a, David C. Cook^{c,d}, Paul J. De Barro^e, Susan P. Worner^f, and Matthew B. Thomas^{g,h}

China and the United States :

The most biologically serious country in the world and also a biological invasion springboard and source of contamination.

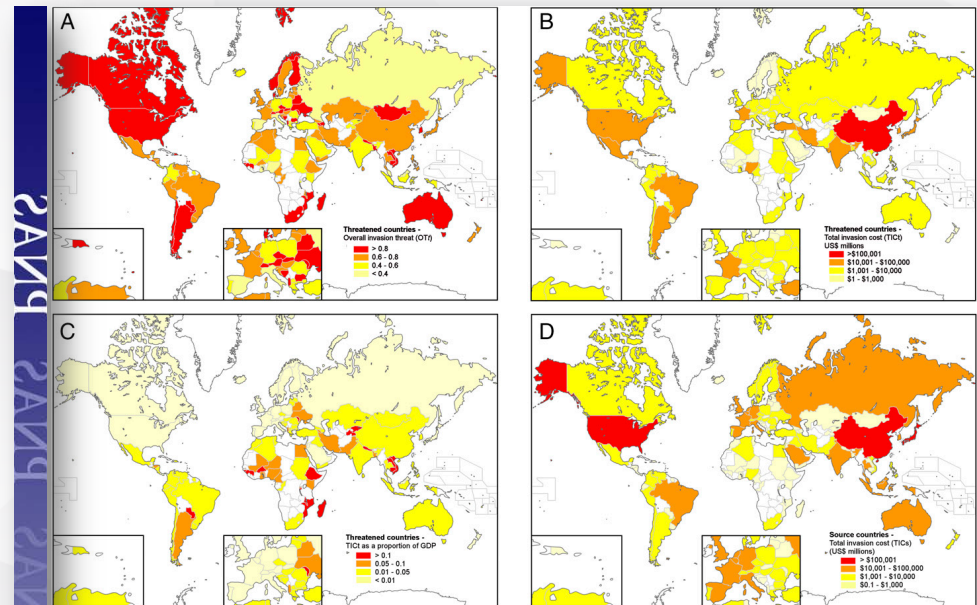


Fig. 1. World map representation of model outputs. (A) The overall invasion threat (OT) to each threatened country, t ; (B) the total invasion cost (TIC) (in millions of US dollars) to threatened countries; (C) the total invasion cost (TIC) (in millions of US dollars), as a proportion of GDP; and (D) the total invasion cost (TIC) (in millions of US dollars) from source countries, s . Those countries without color were not included in the analysis.

➤ Biological invasion and economic threat



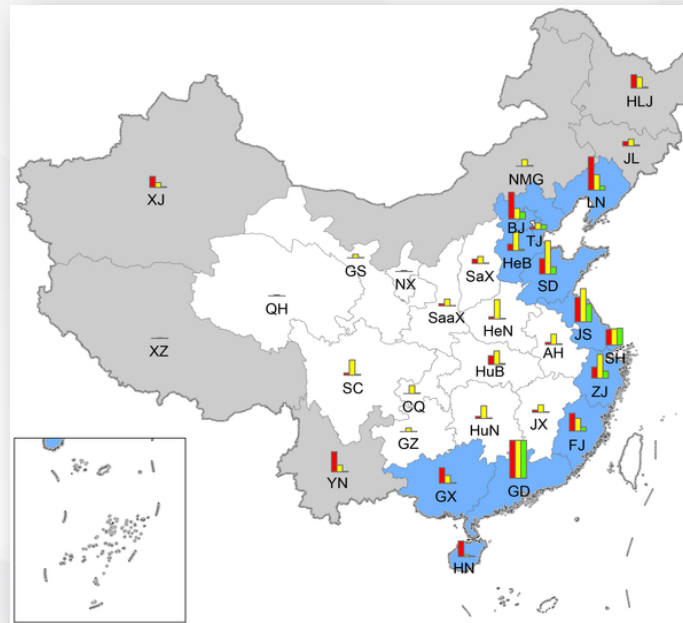
Invasive species cause serious economic losses:

- Confirmed alien invasive organism:
618 species (Agricultural ecosystem accounts for about **50%**)
- National List of Key Controlled Species:
52 species (Agricultural invasive species accounted for **78.8%**)
- Direct economic loss per year:
200 billion yuan (**61.5%** of agricultural economic losses)



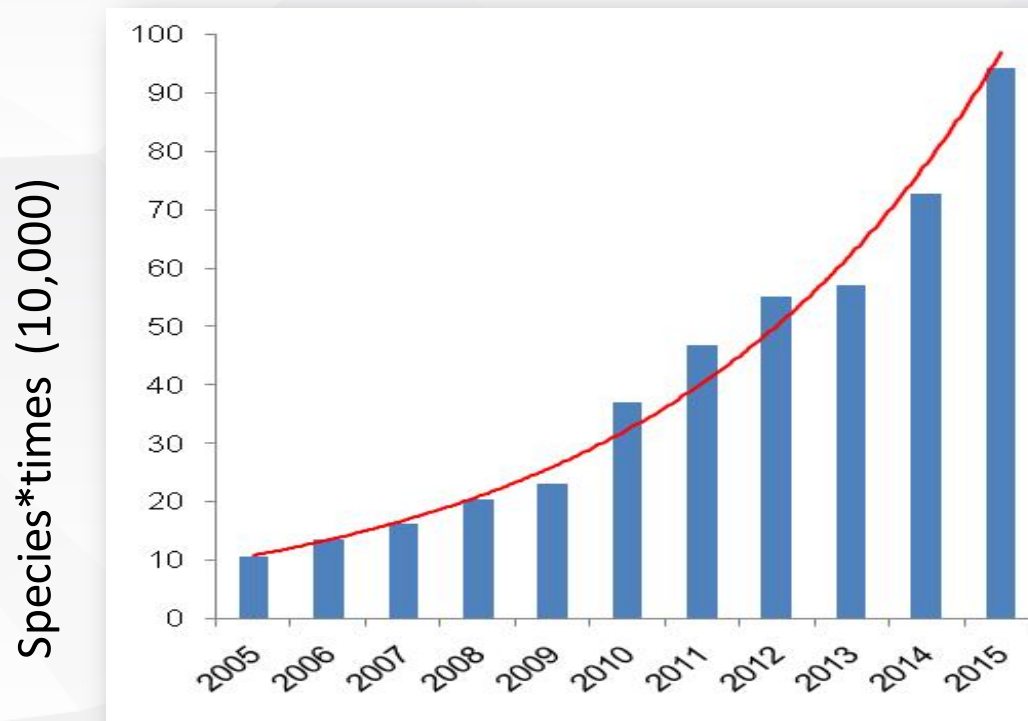


Spatial pattern of Chinese invasive species



Spatial distribution of invasive species recorded for the first time: significantly more coastal areas than in inland provinces.

➤ International trade and Intrusion frequency



Agricultural pests (*times) were intercepted and captured in international trades in China during 2005-2015

02

The Belt and Road Initiatives (BRI)

INTERNATIONAL COLLABORATION ON BRI



VISION AND ACTIONS ON JOINTLY
BUILDING SILK ROAD ECONOMIC BELT
AND 21ST-CENTURY MARITIME SILK
ROAD

➤ SIX ECONOMIC CORRIDORS



- China-Mongolia-Russia Economic Corridor
- New Eurasian Land Bridge
- **China-Central Asia-West Asia Economic corridor**
- China-Pakistan Economic Corridor
- Bangladesh-China-India-Myanmar Economic Corridor
- China-IndoChina Peninsula Economic Corridor



➤ B&R ACHIEVEMENTS



- Up to now, more than 100 countries and international organizations support and participate in the “the Belt and Road” construction actively.
- 86 countries and international organizations has signed the “the Belt and Road” cooperation documents with China.



➤ B&R ACHIEVEMENTS



- The general assembly of the United Nations and the United Nations Security Council are also included in “the Belt and Road” construction content.



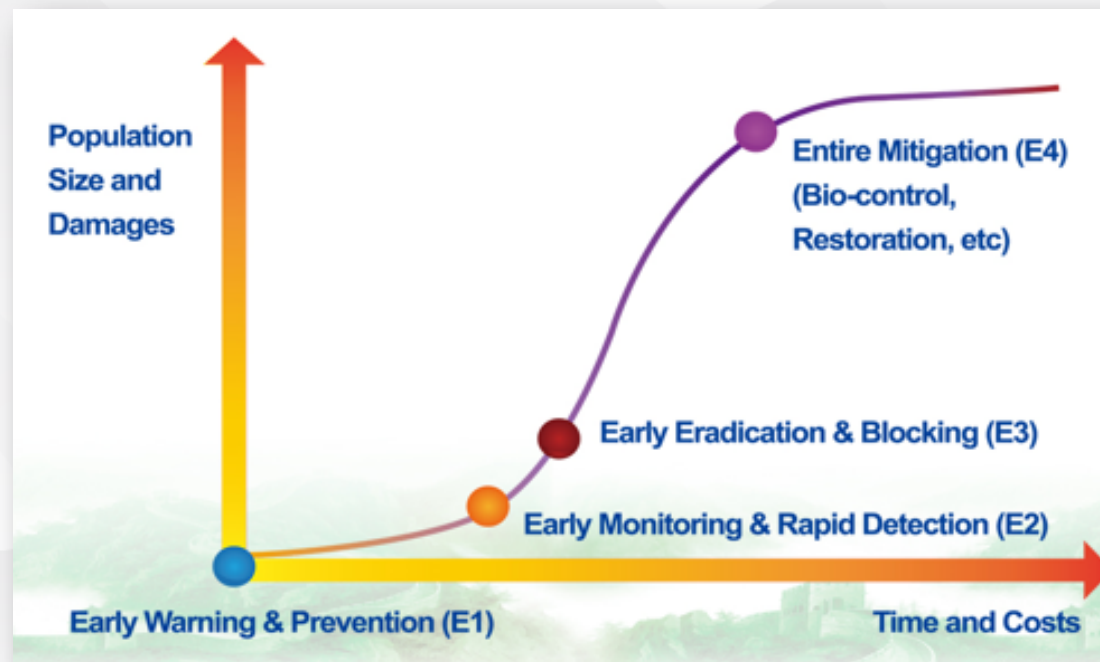
03

The Challenges of the Pest Surveillance

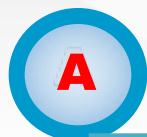
➤ The challenges of the pest surveillance



Different stages for invasion alien species(IAS) Management

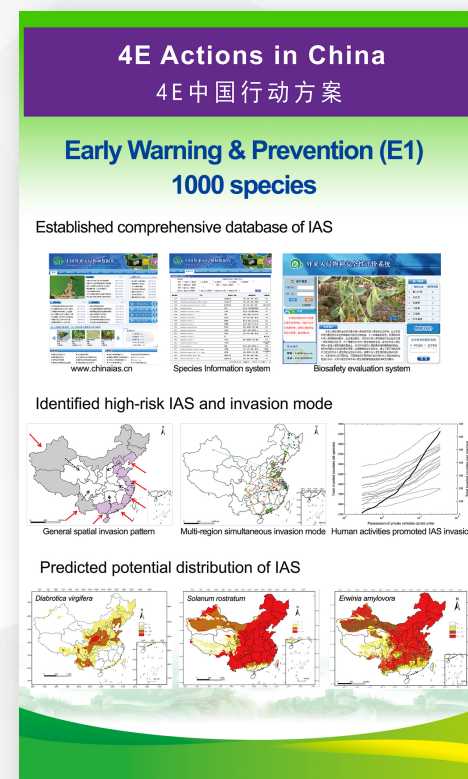


➤ The challenges of the pest surveillance

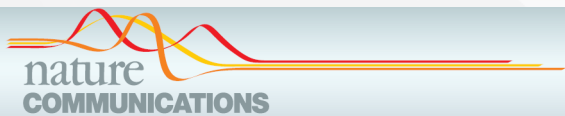


The invasion species sharply increasing

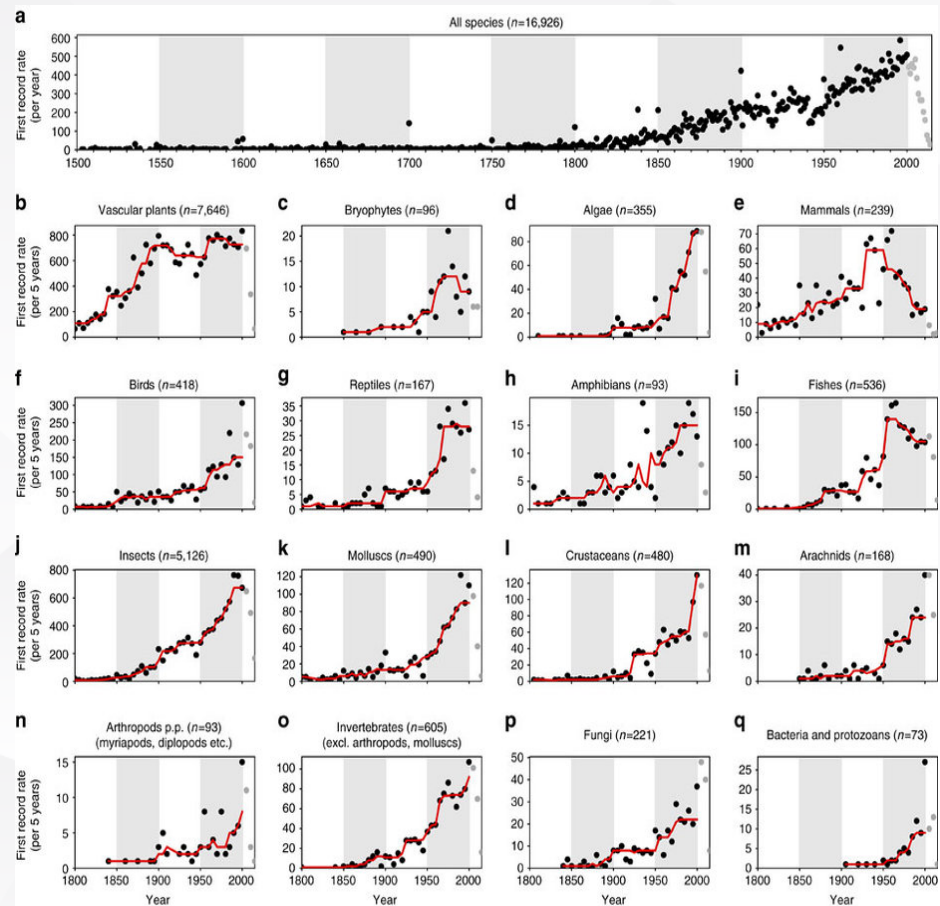
- Importation frequency and risk of pest spread will sharply increase respectively by 80 and 120 times.
- The number of new invasion have increased to 5-6 species per year, almost 30-50 times than 1990s.
- There are 55 invasive species in recent 10 years, of which 87% are major invasive species in agricultural.



➤ The challenges of the pest surveillance



Global biological invasion
is still growing rapidly and
far from saturation



Global temporal trends in first record rates

➤ The challenges of the pest surveillance



Early Monitoring And Rapid Detection

- Monitoring Intelligent System
- DNA Barcoding Identification On-line
- Rapid Molecular Detection (Insect + Pathogen)
- Regional Tracking Monitoring System



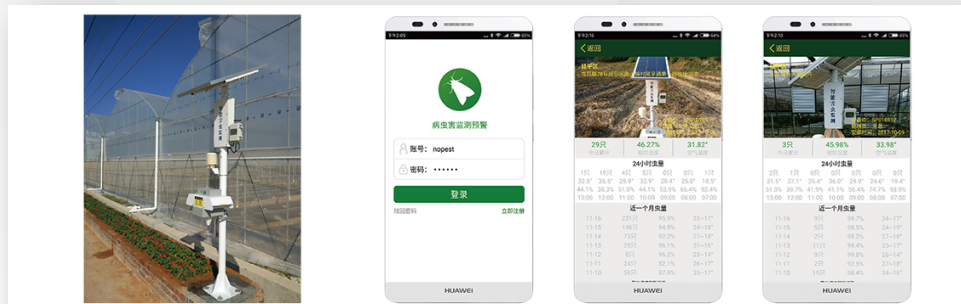


Early Monitoring

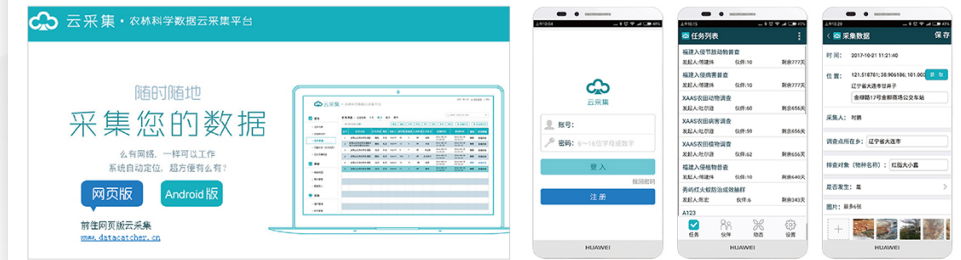
Monitoring Intelligent System

Computer Information Processing System

Solar energy device + Infrared counting device + Information transmission device + Sex pheromone device + User App + Visual dynamics



PDA-based field data collection system

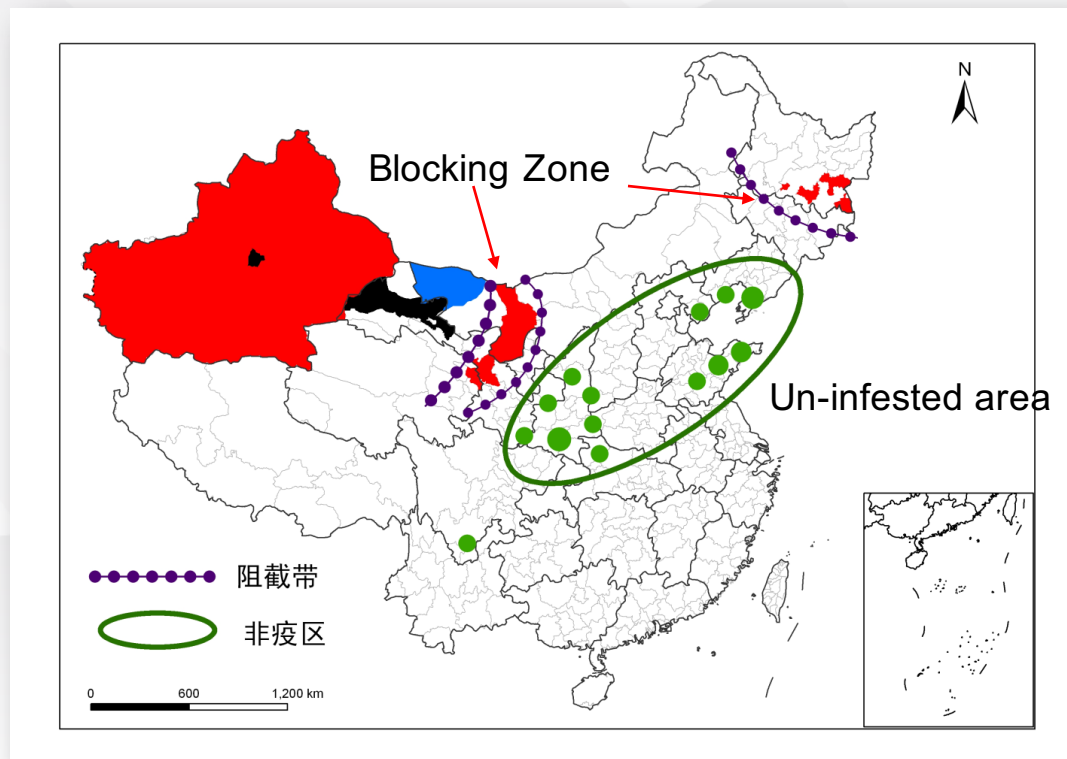




Early Monitoring

Monitoring Intelligent System

Remote-auto-identifying system for monitoring of codling moth



➤ The challenges of the pest surveillance




Early Eradication And Interception

- Eradication of imported plant pest
- Quarantine treatment
- Early interception of new invasions
- Spread patterns of 20 worst invasive plants
- Intercepting control
- Ecological barriers to prevent the establishment of new invasions


4E Actions in China
4E 中国行动方案

Early Monitoring & Rapid Detection (E2)
800 species

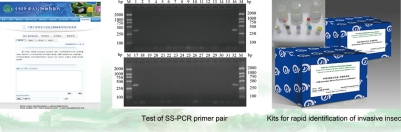
Remote monitoring system



PDA-based field data collection system



Online DNA barcoding systems for invasive alien insects



Test of SS-PCR primer pair Kits for rapid identification of invasive insects

➤ The challenges of the pest surveillance



D Entire mitigation

- Ecological restoration
- Persistent biological control
- global governance
- Regional joint control and prevention

4E Actions in China
4E 中国行动方案

Entire Mitigation (E4)
100 species

Biological control

Before **After** 

Control of coconut leaf beetle *Brontispa longissima* by *Tetrastichus brontispae* and *Ascocodes hispinarum*

Before **After** 

Combined control effects of *Epiblema strenuana* and *Opiusella communis* on *Ambrosia artemisiifolia*

Ecological restoration

Before **After** 

Spartina control and bird habitat restoration at Shanghai Chongming Dongtan National Nature Reserve

04

Globalization and Collaboration

➤ GLOBALIZATION AND CHALLENGES



- Unavoidable and hard facts: the increase of biological invasion as the increase of international trade, human activity, and tourism.

International trade – biological invasion - national interests – international responsibilities



➤ GLOBALIZATION AND COLLABORATION



- Need science and technology innovation for preventing the movement of IAS among the continents, and managing its threats to economy, ecology, culture and human beings.
- Need more close international and cross-regional collaboration to mitigate the losses.



➤ China-ASEAN SPS Cooperation



- In November 2002, the China-ASEAN Free Trade Area Agreement was signed.
- China and the 10 ASEAN countries established and launched the China-ASEAN Free Trade Area on January 1, 2010.

China-ASEAN SPS Cooperation



The screenshot shows the homepage of the China-ASEAN SPS Cooperation Information Web. It features a header with the website title and navigation tabs for Home, News Center, Ministerial Meeting, Technical Working Groups, Regulation, Pest Risk, Concurrent Activities, Agreements, and About Us. The main content area is divided into several sections: Ministerial Meeting (listing the 3rd ASEAN-China Ministerial Meeting on Quality), Latest News (with an overview and a list of recent events), and Regulation of ASEAN (listing various regulatory documents and standards). A map of Southeast Asia is visible at the bottom right.

China-ASEAN SPS cooperation information web

The screenshot shows the homepage of the China-ASEAN Inspection and Quarantine Information Web. It features a header with the website title and navigation tabs for HOME, About AQSIQ, News, Laws & Regulations, Cooperation, Ministerial Meetings, TBT/SPS, and BBS. The main content area is divided into several sections: Latest News (with a list of recent events), Cooperation Forums, Laws & Regulations, and About AQSIQ (with an overview of the ministry). A map of Southeast Asia is visible at the bottom right.

China-ASEAN Inspection and Quarantine Information Web

China-Vietnamese Cooperation



From 2009 to 2018, the Sino-Vietnamese border fruit fly monitoring sites covered 10 Sino-Vietnamese border land ports and border trade points, including Nanning, Dongxing, Youyiguan, Puzhai, Shuikou, Longbang and Pingmeng, and 15 border areas including Haiphong, Mang Street, Xiaolong, Chaling, Lijiang, Hummer, Lang Son, Laojie, Jincheng and Qingshui Ports, where 1,650 monitoring points were set up, and a total of 25 species of 8 genera of fruit flies were detected.

➤ China-Vietnamese Cooperation



The Border Fruit Flies Monitoring Cooperation Between China And Vietnam

China-New Zealand Cooperation



THE OUTCOME IS EIGHT OPPORTUNITIES GROUPED INTO FOUR CATEGORIES

1. TRADE FACILITATION

Collaborating to help optimise trade facilitation under the BRI.



1.1 Biosecurity – Build on collaboration agreements already in place to enhance biosecurity efforts.



1.2 Customs clearance – Work with BRI countries to enhance customs clearance protocols.

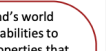


1.3 Hubbing – Establishing supply chain hubs in China or elsewhere utilizing Belt and Road infrastructure for supply chain benefits.



2. NEW ZEALAND AS A CONDUIT TO SOUTH AMERICA

Enabling connectivity between South America and China to facilitate the movement of people and goods.



3. CREATIVE SECTOR

Utilising New Zealand's world leading creative capabilities to develop creative properties that can enhance people-to-people links and cultural engagement.

3.1 Creative properties – Collaboration on the generation of creative properties focused on increasing the understanding of peoples and cultures along the BRI.

3.2 BRI Interactive simulations – Collaboration to produce a game simulation which is both engaging and informative.

3.3 Epicot type location based experience – New Zealand could work to create a center to showcase the cultural aspects of each BRI country.

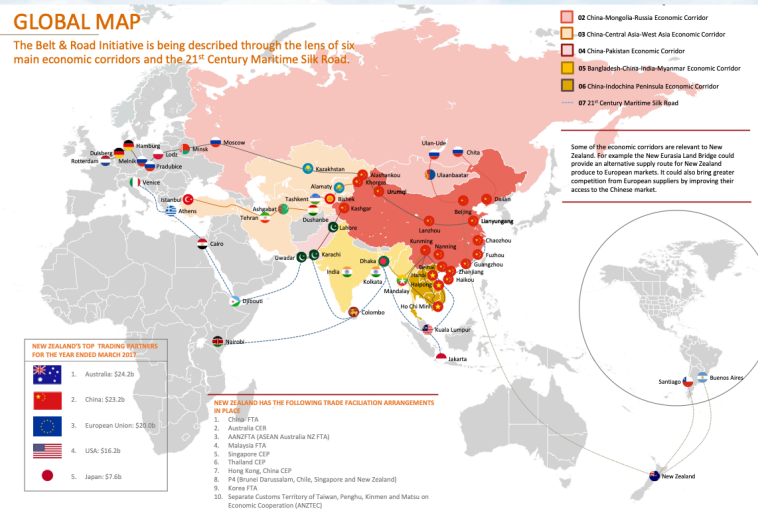
4. INNOVATION

Utilising our innovative capability through research collaboration and commercialisation links with China and across BRI.



GLOBAL MAP

The Belt & Road Initiative is being described through the lens of six main economic corridors and the 21st Century Maritime Silk Road.





NEW GREEN GREAT WALL



Management

Prevention

Thanks for your attention
Q & A ?