



**Chinese Academy of Agricultural Sciences**

# **Chinese initiative “One Belt and One Road” in relation to plant health**

**Kongming Wu**

# Outline

- **Plant health in China**
- **Importance of international co-operation**
- **Opportunity of “One Belt and One Road”  
initiative**

# Plant health in China

## Goals of agricultural production in china

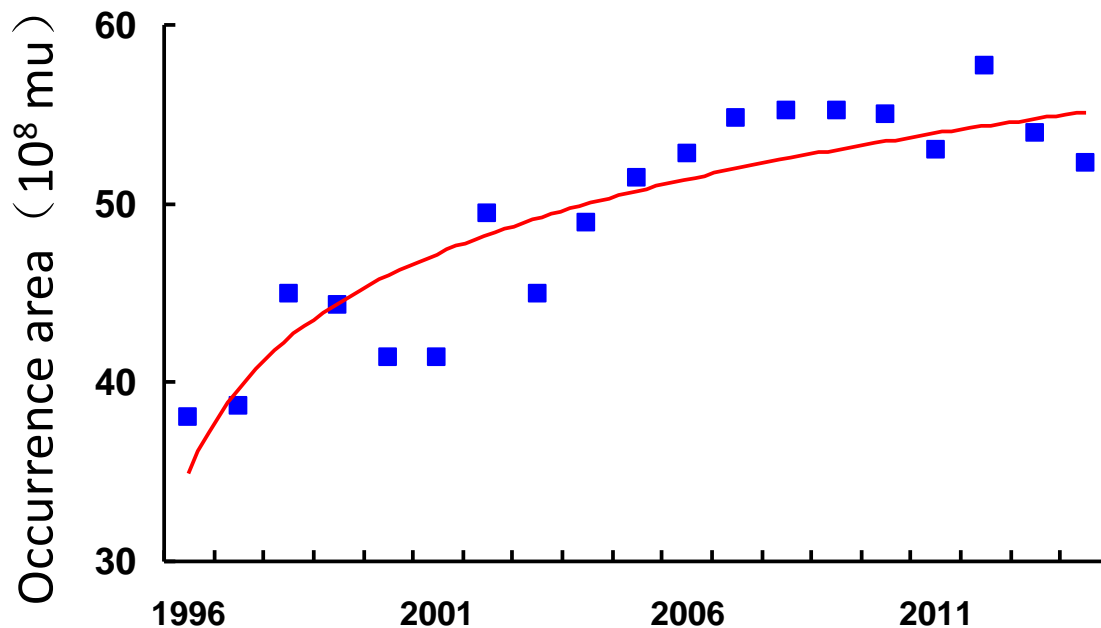
- ◆ Green productive process
- ◆ Low productive cost
- ◆ Sustainable development



# Plant health in China

## Crop pests in China

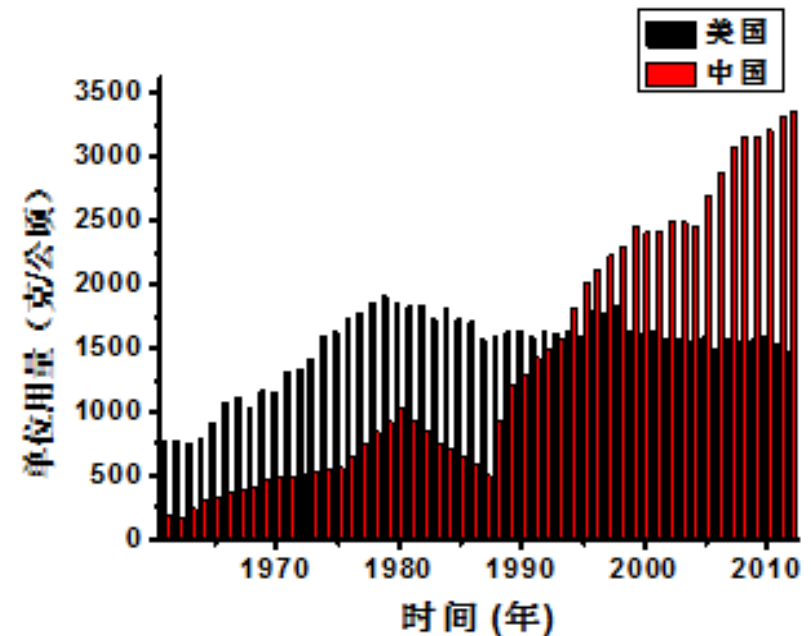
- ◆ More than 1000 species of crop pests
- ◆ Annual occurrence area ~450 million ha
- ◆ Key factor for food security and safety



# Plant health in China

- Difficulty for small farmer to use green control method
- Low cost and high convenience to use chemical pesticides

Chemical control accounted for 80% in China



- Total use of pesticides in China (2013): 1.83 million tons
- Use of pesticides and insecticides per unit area: 2.3 and 14.7 times compared with the U.S.

# Plant health in China

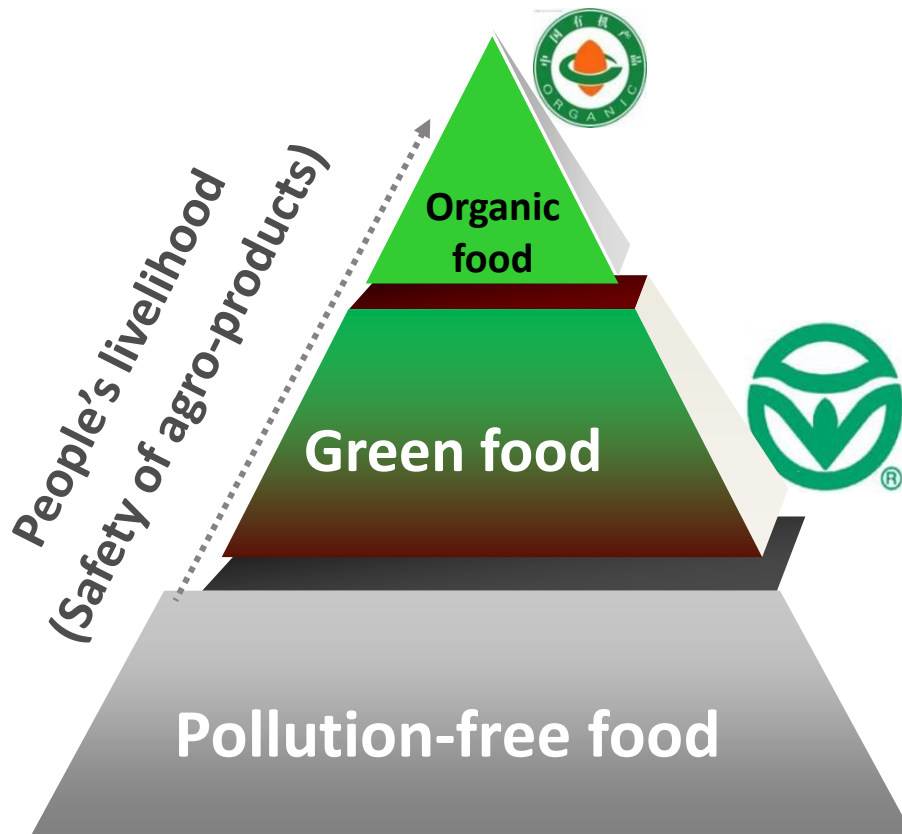
## Pesticide over use

- **Environmental pollution**
- **Safety of agro-products**
- **Increased resistance to pesticides**
- **Decreased bio-diversity**



# Plant health in China

## Green management of crop pests — A social, economical and ecological demand



### 农业部文件

农农发〔2015〕2号

农业部关于印发《到2020年化肥使用量  
零增长行动方案》和《到2020年农药  
使用量零增长行动方案》的通知

各省、自治区、直辖市和计划单列市农业（农牧、农村经济）厅（委、局），新疆生产建设兵团农业局，黑龙江省农垦总局：

为贯彻落实中央农村工作会议、中央1号文件和全国农业工作会议精神和《“稳粮增收调结构，提质增效益”的工作主线，大力推进化肥减量增效、农药减量控制，积极探索产出高效、产品安全、资源节约、环境友好的现代农业发展之路，农业部制定了《到2020年化肥使用量零增长行动方案》和《到2020年农药

— 1 —

In Mar. 2015, MOA China announced the “Act of zero increase in pesticides by 2020”



# Plant health in China

## ➤ Using green management products to replace chemical

- ❑ Natural enemy
- ❑ Biological pesticide
- ❑ SIT
- ❑ Physical control
- ❑ Feeding attractant
- ❑ Insect pheromone
- ❑ Agronomy based control
- ❑ Plant resistance

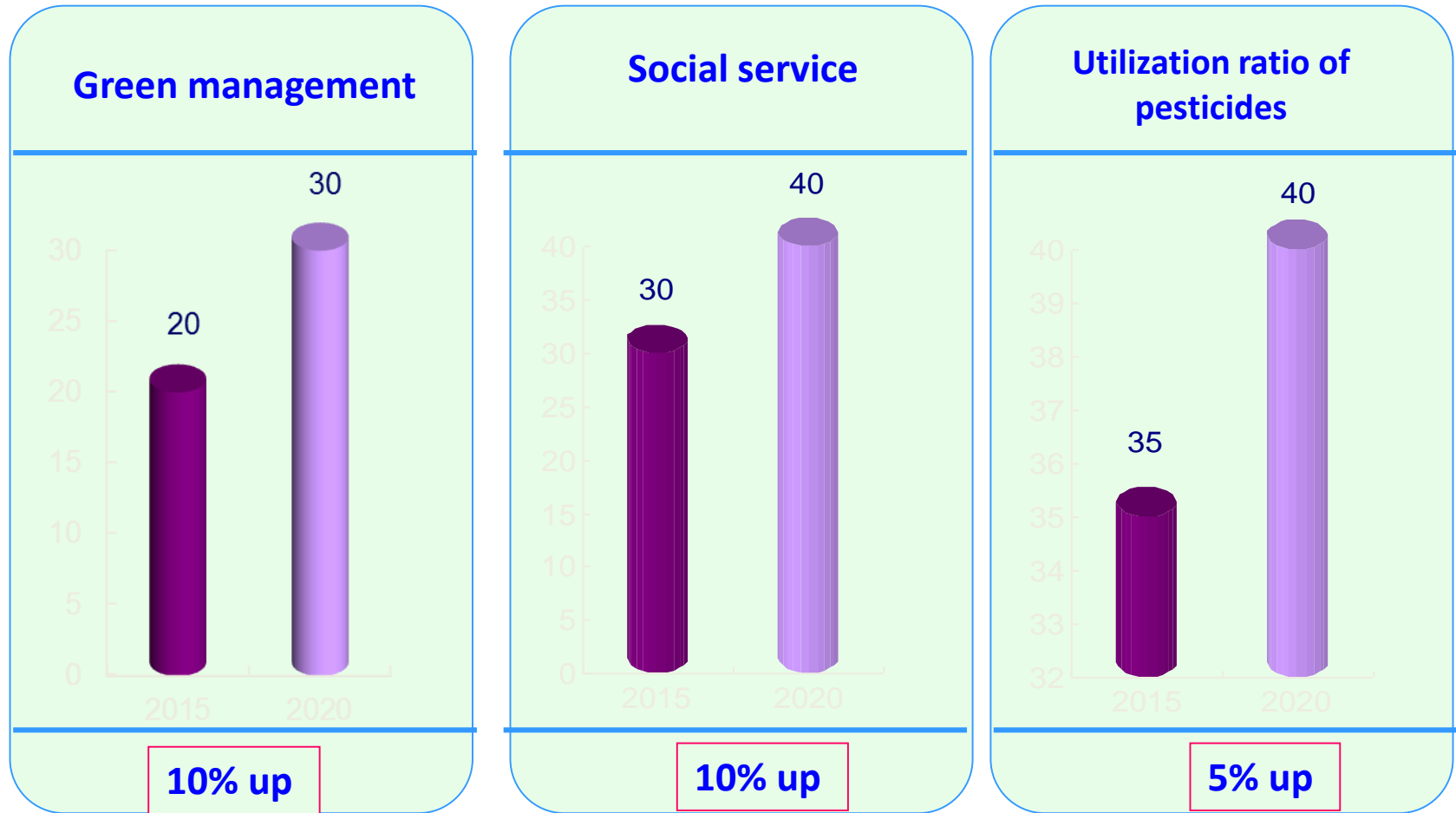
❑ Transgenic crops

❑ IPM





# Plant health in China



- By 2020, pesticide use in terms of unit area will be restricted below the average level of the last 3 years

# Plant health in China

- To establish modern S&T innovation system
- To establish monitoring and warning information system
- To establish modern quarantine and IAS management system
- To establish small farmers plant health service system
- To train modern farmers

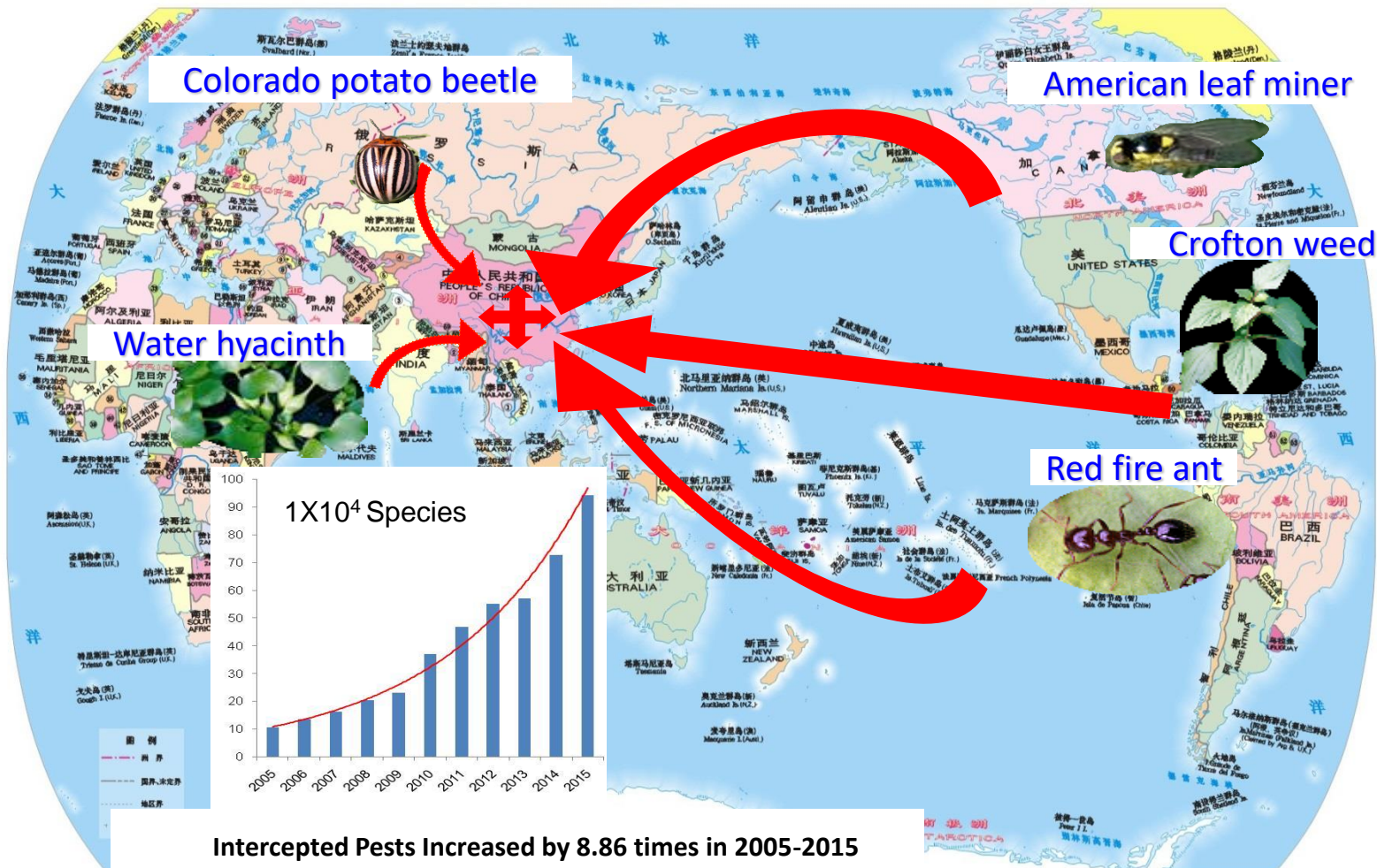
# Importance of international co-operation

## ➤ Invasive alien species (IAP)

Globalization increases biological invasions risk

世界地图

WORLD MAP



# Importance of international co-operation

## Damage caused by

## Fall armyworm CABI plantwise



Feeding by young caterpillars results in semi-transparent patches on the leaves called windows.



Young caterpillars can spin silken threads which catch the wind and transport the caterpillars to a new plant.



Feeding through the whorl can cause a line of identical 'shot' holes, when the leaf unfurls.



As they develop, Fall armyworm move permanently into the whorl. This means that it is difficult to detect early infestations.



Feeding can cause the whorl and upper leaves to be a mass of holes, ragged edges, and caterpillar poo (called "frass").



The caterpillars usually burrow into the side of the cob.



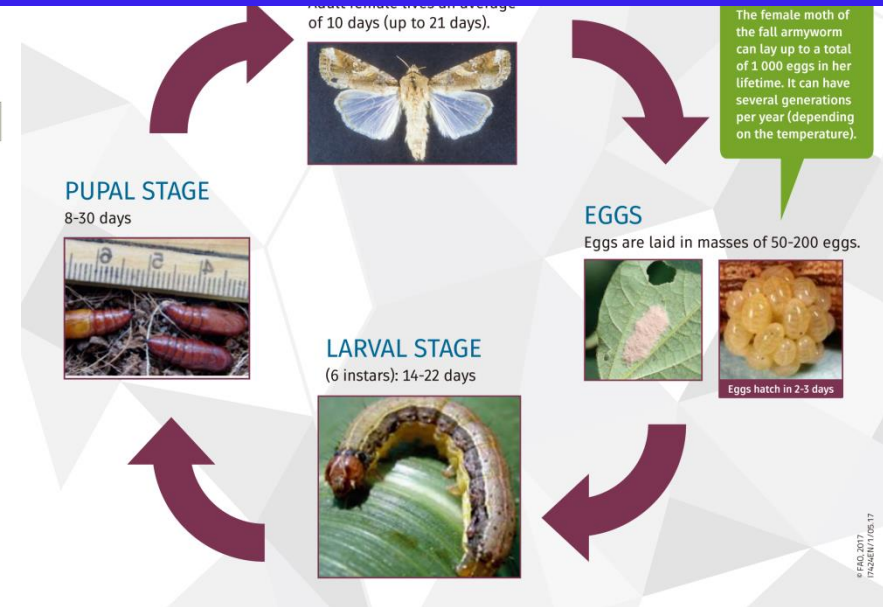
Fall armyworm infestation causes stunting and destruction of developing tassels and kernels.



When the caterpillars burrow into the side of the cob, damage to grains can lead to rot.



Holding a maize plant damaged by Fall armyworm.



## Key facts on Fall Armyworm

- FAW is an insect native to tropical and subtropical regions of the Americas.
- FAW Larvae feeds on more than 80 plant species, including maize, rice, sorghum, sugarcane, vegetable and cotton.
- FAW have a number of generations per year and the adult moth can fly up to 100 km per night.

For more info on Fall armyworm please visit:  
[www.plantwise.org/fallarmyworm](http://www.plantwise.org/fallarmyworm)

KNOWLEDGE FOR LIFE

Sources: FAO, CABI



# Importance of international co-operation

## NEWS IN FOCUS

**NEUROSCIENCE** Brain-encircling neuron could offer clues to consciousness **p.14**

**ASTRONOMY** Mystery cosmic bursts come of age, posing research challenges **p.16**

**CONSERVATION** Guidelines push for ethics in killing of wild animals **p.18**



**MIGRATIONS** Refugee scientists tell their stories **p.24**



Fall armyworm caterpillars are devastating crops in Africa.

AGRICULTURE

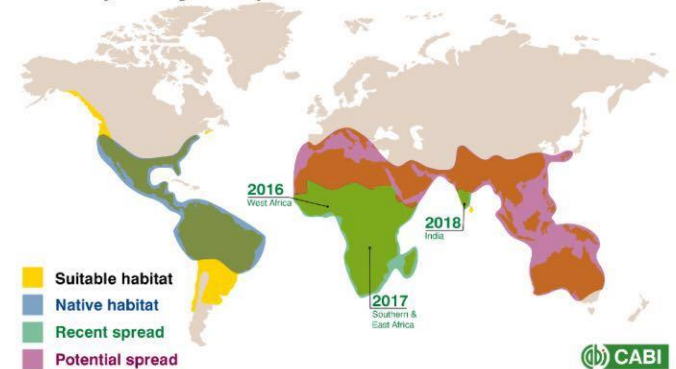
## Invasive pest hits Africa

*As hungry caterpillar eats its way through 12 countries, researchers begin to fight back.*

BY SARAH WILD

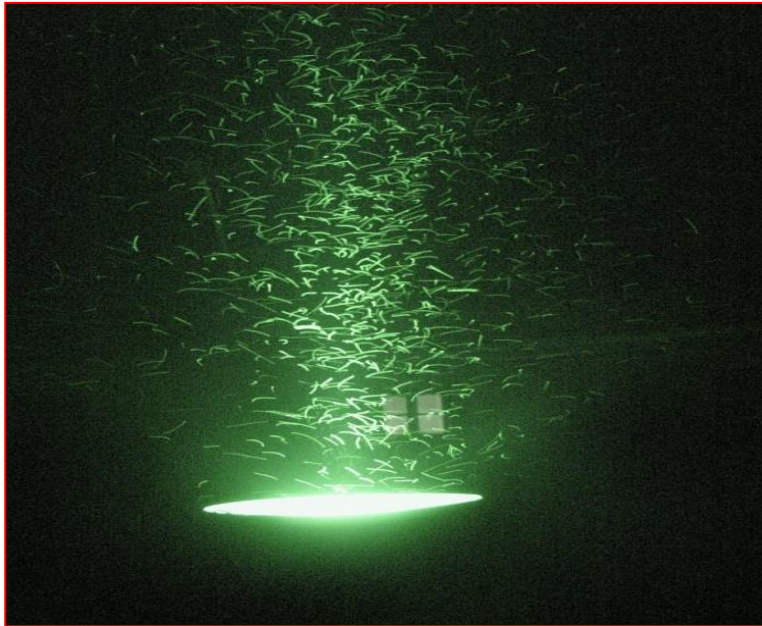
response. Sixteen countries agreed to urgent January 2016, and has since moved to at least

### Fall armyworm global spread



Dr Roger Day, CABI's Programme Executive for Action on Invasives, says: "This is disappointing news but not a surprise, as our previous work has shown the pest was likely to spread beyond Africa into other parts of the world. CABI and the University of Exeter have been forecasting the global extent of the fall armyworm invasion for a new piece of upcoming research. Based on this work, I think we can expect to see this pest spread rapidly in India and to other countries in many parts of Asia."

# Importance of international co-operation





# Importance of international co-operation

棉铃虫生物食诱剂  
**BioAttract™**  
**澳朗特™**

中国农业科学院植物保护研究所 (共同研发)  
Bioglobal Limited (澳大利亚)  
深圳百乐宝生物农业科技有限公司

高效广谱  
雌雄通杀

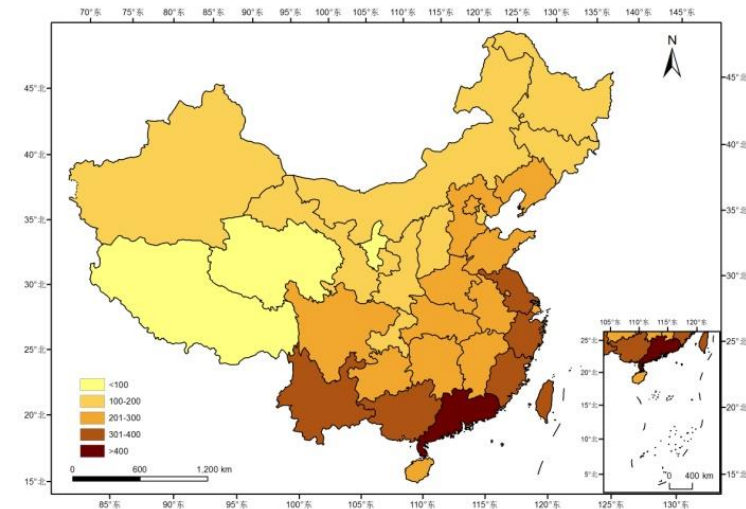
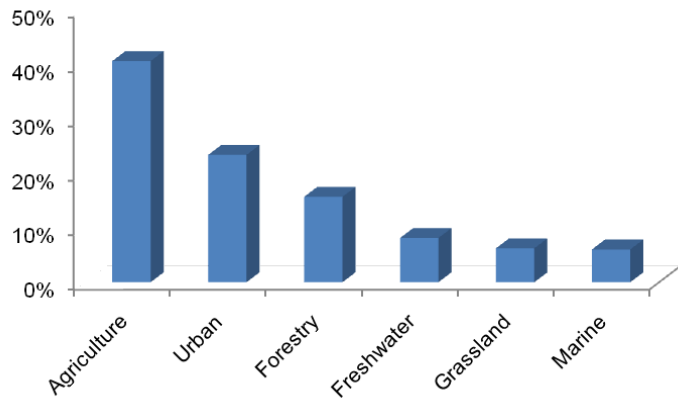
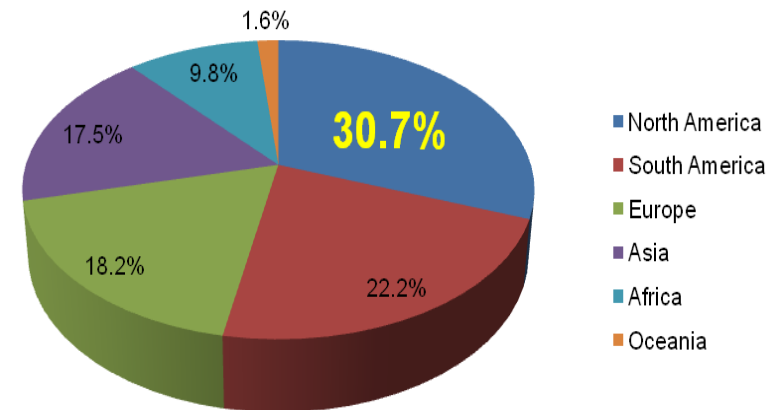
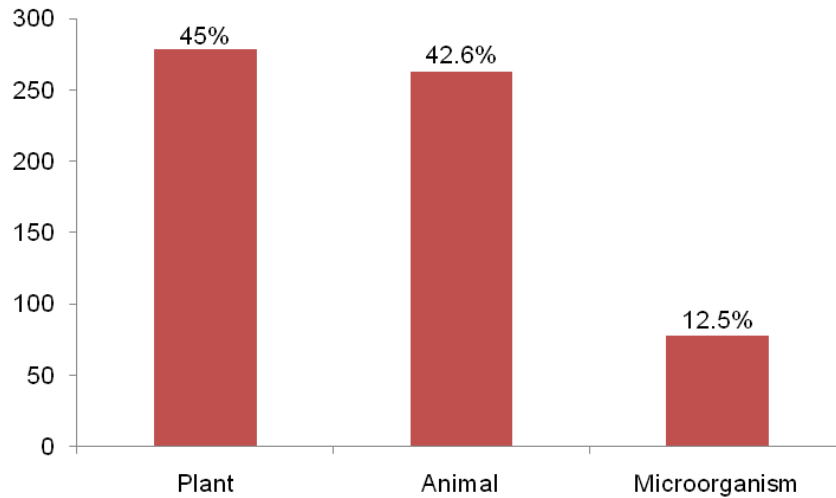
创新性可持续  
作物管理解决方案

**百乐宝®** 安全高品质农业投入品专家  
BIOGLOBAL Expert Dedicated to Safe and Quality Agricultural Inputs

A white plastic bottle of BioAttract cotton bollworm biological attractant is shown in the center of a green field. The bottle has a label with the product name and some Chinese text. The background is a lush green field with rows of crops.



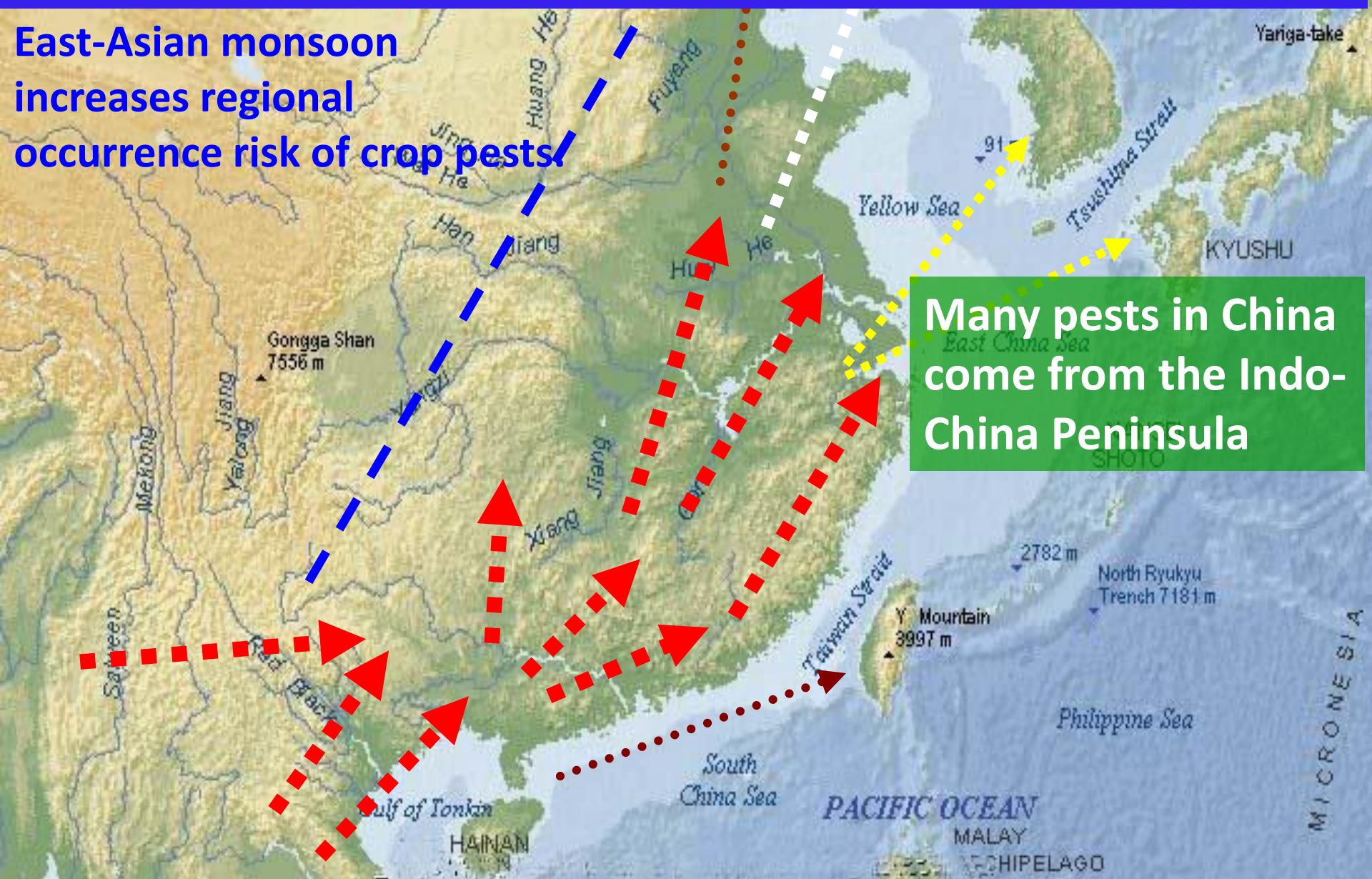
# Importance of international co-operation



Invasive Alien Species in China

# Importance of international co-operation

East-Asian monsoon  
increases regional  
occurrence risk of crop pests





# Opportunity of international co-operation

**China firstly gave the concept “One Belt and One Road” in 2013**



# Opportunity of international co-operation

## VISION AND ACTIONS ON JOINTLY BUILDING SILK ROAD ECONOMIC BELT AND 21<sup>ST</sup>-CENTURY MARITIME SILK ROAD

2015/03/28

Issued by the National Development and Reform Commission,  
Ministry of Foreign Affairs, and Ministry of  
Commerce of the People's Republic of China,  
with State Council authorization



Five four youth festival, was set up to  
May 4th movement. It originates from the imperialist  
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# Opportunity of international co-operation

## SPECIAL EMPHASES ON PLANT HEALTH

### **S &T Co-operation:**

- To strengthen deeply-collaboration in science and technology of agriculture
- To reinforce collaboration on prevention and management of cross-regional agricultural invasive pests
- To tighten collaboration on climate change and biodiversity
- To enhance ecological civilization
- To develop more GREEN pest control products

### **Custom Co-operation:**

- To enhance collaboration on mutual recognition of quarantine,
- To improving bi/multilateral cooperation in inspection and quarantine techniques, certification and accreditation, standard measurement...

### **Platform Co-operation:**

- To establish Joint Laboratory, Technical Transfer Center between/among OBOR countries for providing facilities for scientists



# Opportunity of international co-operation

## **SPECIAL EMPHASES ON PLANT HEALTH**

### **Exchange co-operation:**

- To exchange scientists,
- To share more information on science and technology

### **Education co-operation:**

- To jointly hold international workshops
- To run education training on S & T
- To train scientific youth, women, students, volunteers

# Opportunity of international co-operation





# Opportunity of international co-operation

## Chinese Academy of Agricultural Sciences (CAAS)



**Crop Science**



**Horticulture Science**



**Animal Science**



**Veterinary Medicine**



**Agro-resources and ENV**



**Agro-Mechanization and Engineering**

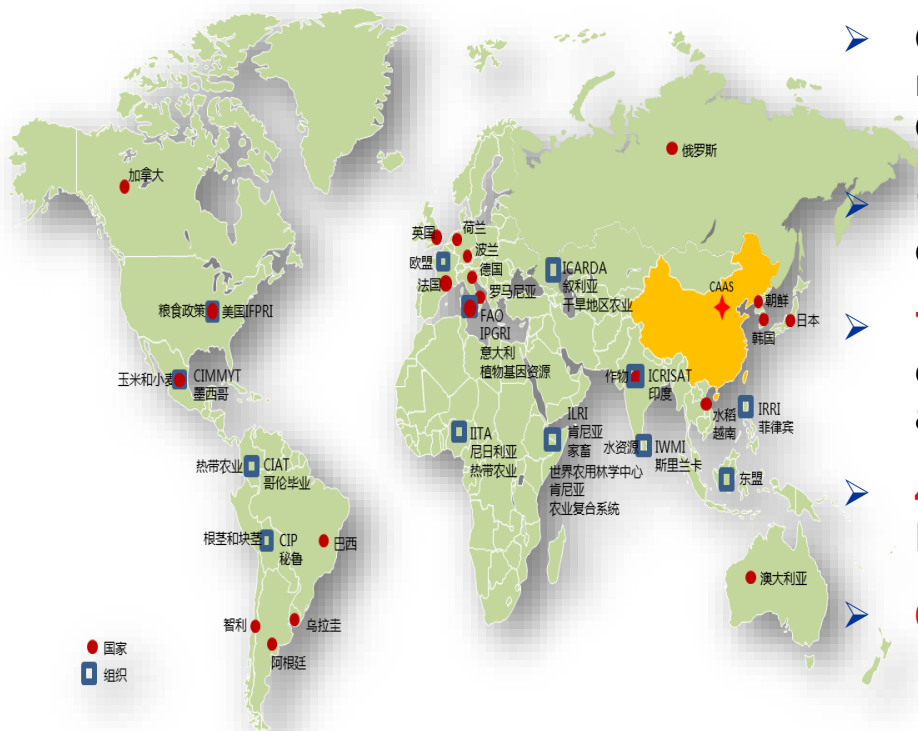


**Agro-product Quality, Safety and Processing**



**Agro-Information and Economics**

# Opportunity of international co-operation



- Cooperation with: more than **100** countries and regions, **38** international organizations, **7** MNCs and Gates Foundation with **82** agreements signed
- **13** Representative Offices of international organizations
- **70** Joint Laboratories / Joint Research Centers with counterparts in the United States, Canada, Japan, etc., and also some international organizations
- **4** Overseas Joint Laboratories were established in Brazil, Belgium, Australia, Kazakhstan
- **6** FAO and OIE Reference Laboratories.



中国农业部与国际应用生物科学中心  
生物安全联合实验室

MOA-CABI Joint  
Laboratory of Bio-safety





# Opportunity of international co-operation

## *CAAS Green Super Rice supports food security in Africa*

- Funded by Bill Melinda Gates Foundation(41.25 Million USD), targeted 14 countries in Asia and Africa
- Covering 450,000 hectares in Africa, and greatly lifting farmers' income and enhancing the food security in Africa
- Over 800 personnel received relevant training courses on seed production and cultivation management



中国农业创新助力发展（国际论坛）

比尔·盖茨

《人民日报》 2013年03月26日 03版

1968年，我正在读中学，当时保罗·埃利希的《人口爆炸》一书影响很大。这本书的开头是这样写的：“让全人类吃饱的努力已经失败，70年代将有亿万人因饥饿丧



“Green super rice is a gift from China's agricultural innovation to the world.”

—Bill Gates



# Opportunity of international co-operation

## Graduate School of CAAS



- ❑ 176 African students
- ❑ 154 doctoral students, accounting for 87.5% of the total number of African students.
- ❑ from 28 different African (43 from Ethiopia, 23 from Egypt, 21 from Nigeria, 13 from Sudan, 9 from Kenya, etc. ) .
- ❑ Study in 25 CAAS institutes and 30 majors such as Crop Genetics and Breeding, Crop Cultivation and Farming System, Crop Germplasm Resources, etc.

# Opportunity of international co-operation

## *CAAS takes the lead in coordinating Sino-African 10+10 Initiatives for Agricultural Research Organizations*



- With the support from Chinese Ministry of Commerce and Ministry of Agriculture and Rural Affairs, CAAS takes the lead in coordinating Chinese Agricultural Research Organizations building bridges with African counterparts, the *Sino-African 10+10 Initiatives*.

- So far, over 10 African countries including Kenya, Ethiopia, Sao Tome and Principe, Egypt, Rwanda, Sultan, Cote d'Ivoire, Zimbabwe, Mozambique, Nigeria, Tanzania, Zambia, Malawi, South Africa and Angola, have participated in this Initiative.

# Opportunity of international co-operation

## OPPORTUNITIES

- ❑ Focusing on **BETTER Cross-Regional Control (BCRC) or Better Border Control (BBC)** points for expanding international collaboration in plant protection area, especially focuses on biosafety and food-security topics
  - ❑ Developing **BETTER** proposals on scientific research, technology transfer, platform establishment for DEEPTH collaboration
  - ❑ Applying **BIG** collaboration funds from MOST, MOA or NSFC
- 
- ◆ **Improving** Better Cross-Regional Control of agricultural pests
  - ◆ **Intensifying** the technical transfer among OBOR countries

# Opportunity of international co-operation

## OVERALL GOALS

- ◆ To promote the best pest management practices in order to contribute to global agricultural sustainable development,
- ◆ To facilitate the international trade, to ensure food security, food safety, and to alleviate poverty



**PLANT HEALTH INTERNATIONAL  
COOPERATION**

**DISCUSS TOGETHER  
ENJOY TOGETHER  
COOPERATE TOGETHER**





THANK YOU

