BATTLE WITH COLORADO BEETLE

SURVEILLANCE ON TRANSBOUNDARY PESTS

NATIONAL AGRO-TECHNICAL EXTENSION AND SERVICE CENTRE (NATESC)

MINISTRY OF AGRICULTURE AND RURAL AFFAIRS OF CHINA

Xiaonan Li   *28 October 2019*   *Shizuoka*

BACK GROUND

1. Colorado Beetle *Leptinotarsa decemlineata* (Say)

Quarantine importance:

- The most important insect defoliator of potatoes.
- 100 of the world's worst invasive alien species.
- One of the quarantine pests of China.

Exclusion difficulties:

- Starvation tolerance
- Drought resistance
- Pesticide resistance
- Partial Migration
- Wild host existence

Fig.1 Colorado Beetle by Runzhi Zhang

2. Pest status in China

In 1993, Colorado beetle was first found in China. It is currently distributed in parts of 3 provinces only.

1993,
Xinjiang province

Be contained more than 20 years here.

2014,
Heilongjiang province

1 county left now.

2013,
Jilin province

Only 1 county.

Northeast producing area
North China producing area
Northwest producing area
Southwest producing area
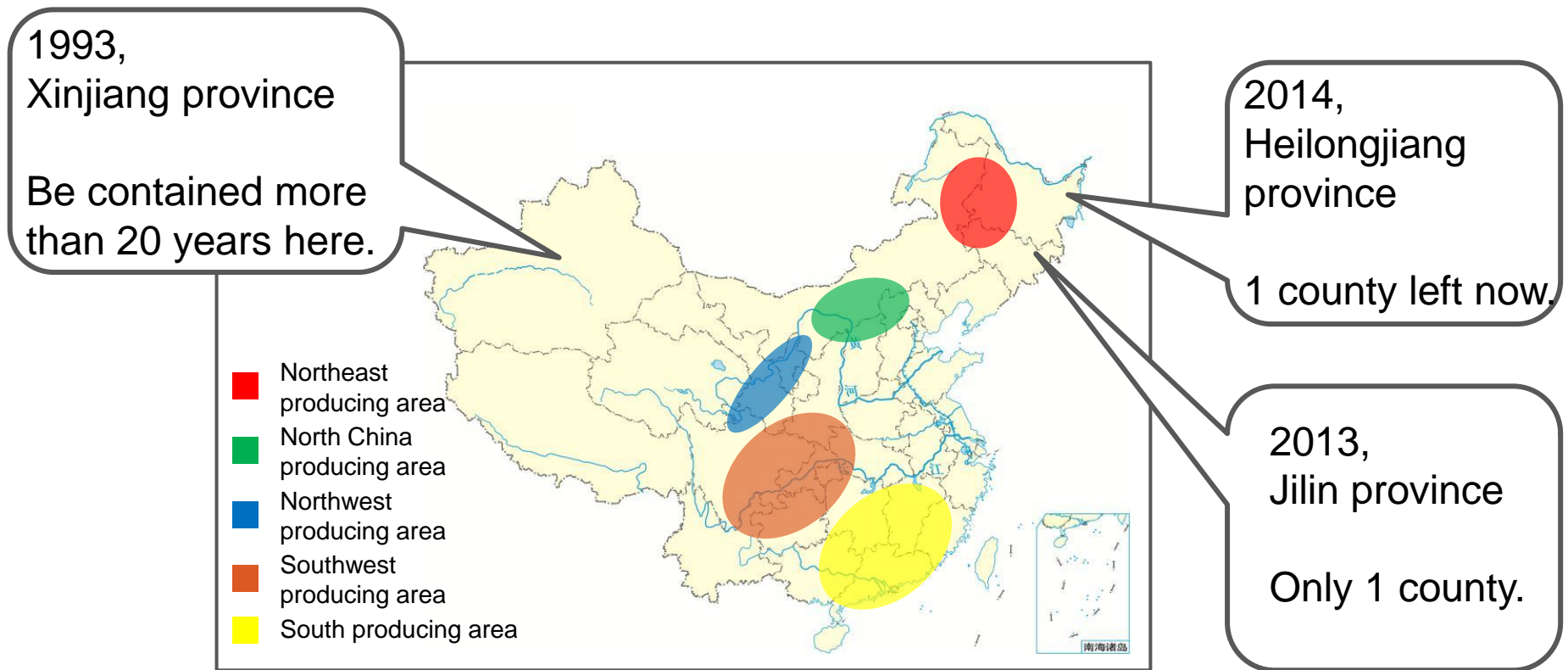South producing area

南海诸岛

Fig.2 Schematic map of 5 main potato producing areas in China

ACHIEVEMENTS

1. The incursion pathway has been found

Colorado beetle in Heilongjiang province were mainly introduced from the border of China and Russia.

- Colorado beetle was removed from the quarantine pest list of Russia in 2007. It outbreaks in Primorsky Krai area (Приморский край) these years.

- Heilongjiang and Russia share a long border which has a frequent flow of people and goods.

- Lacking of mountain barrier that Colorado Beetle can spread naturally (e.g. by wind).

Fig.3 Colorado beetle spread from border counties to inland

2. A specific prevention strategy has been developed

According to the PRA, local geographical environment and traffic network, 4 exclusion zones have been established with corresponding measures application.
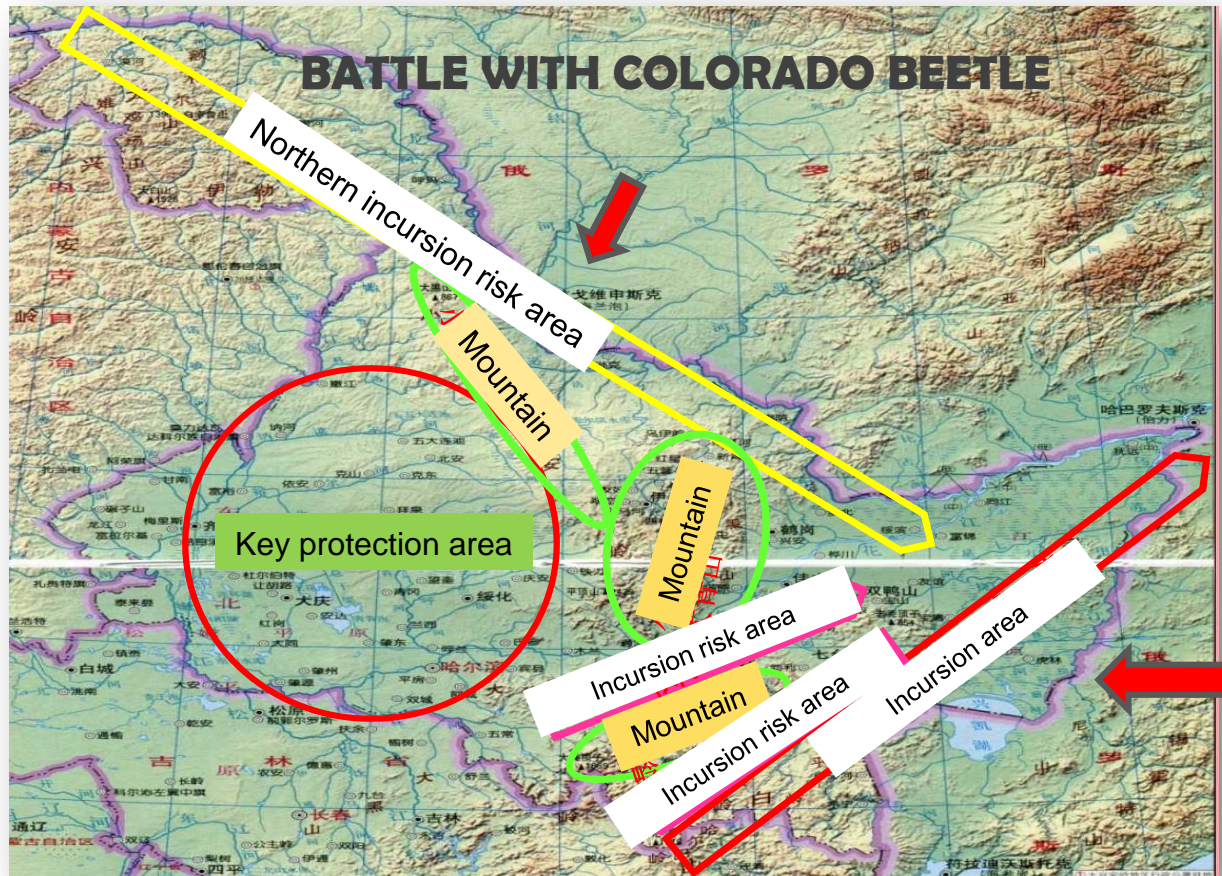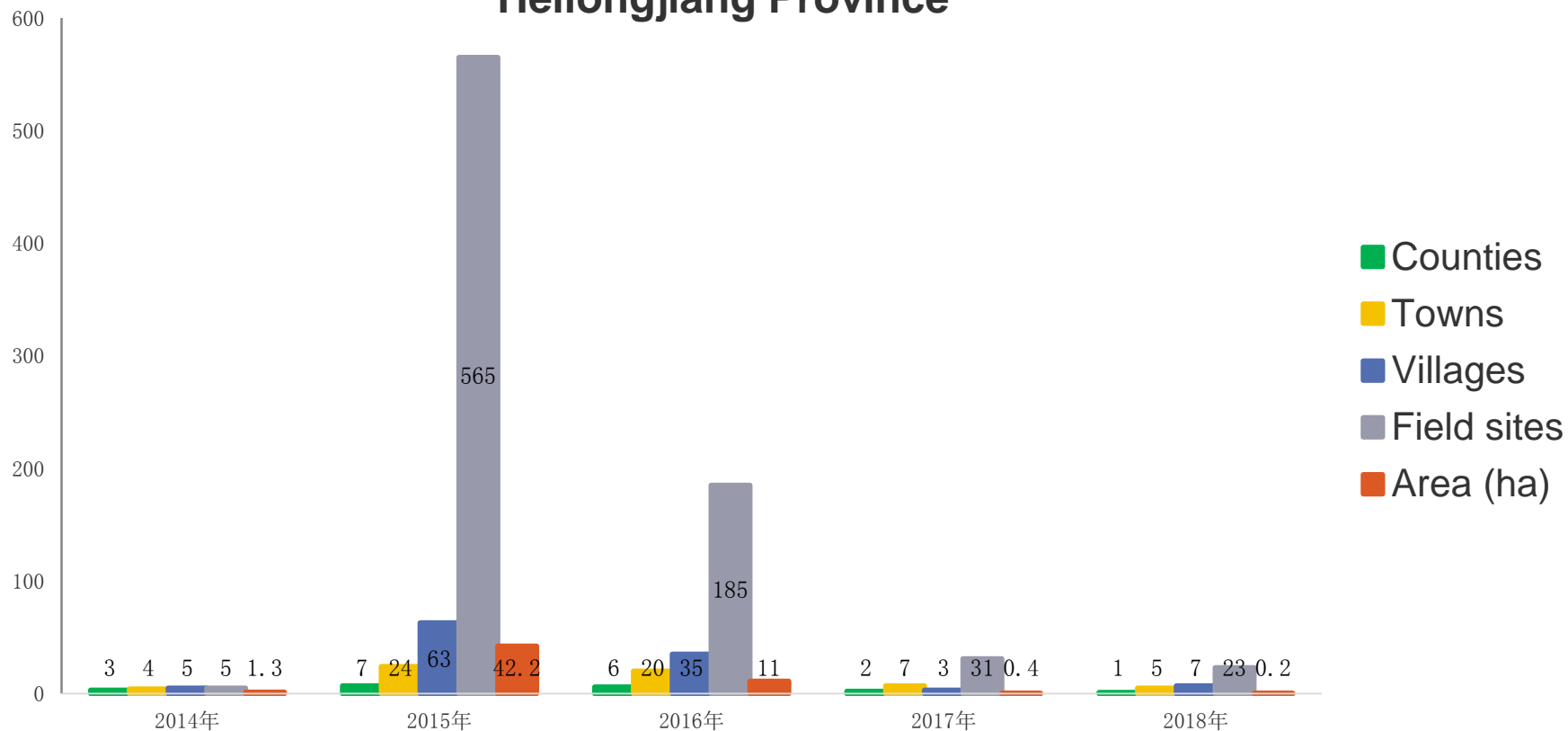

Fig.4 Schematic map of Colorado beetle prevention strategy in Heilongjiang

3. The scope of occurrence of Colorado Beetle has been reduced dramatically

Fig.5 Statistics of Colorado Beetle Status in Heilongjiang Province

4. The bilaterally cooperation on surveillance and control has been launched

Last month, a MoU about Colorado beetle was signed under the joint communique of the 24th regular meeting between Chinese and Russian prime ministers.

- To exchange pest status
- To conduct joint control
- To provide technical support
- To expand research cooperation
- To carry out joint habitat inspection

Fig.6 Signing ceremony of the joint communique of the 24th regular meeting between Chinese and Russian prime ministers

ACTIVITIES

1. General Surveillance

There are more than 600 fixed monitoring points in Heilongjiang province for effective surveillance.

- All the monitoring points have been uniformly numbered and marked.

- Their geographical location, monitoring objects, responsible person and corresponding contact information have been documented.

- The requirements of the monitoring task, suspected sample collection, information submission has been specified.
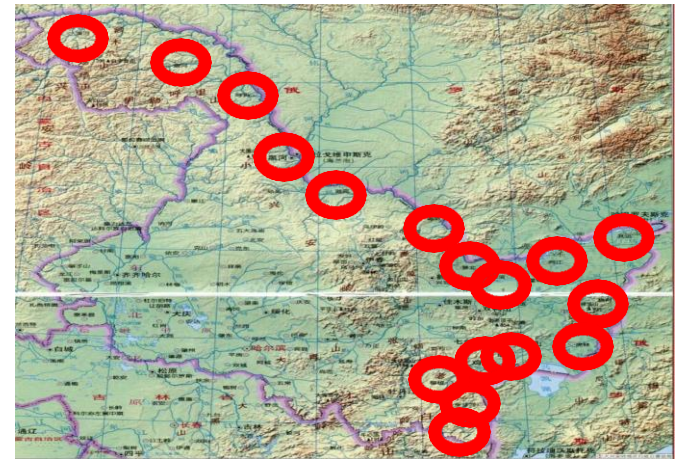

Fig.7 Schematic map of the counties along China-Russia border

2. Specific Surveillance

a) Detection and delimiting survey to determine the status of the pest

- **Area**： potato fields in more than 40 counties (cities) that involve the border counties, large potato producing counties and key eastern production regions
- **Period**： the entire reproductive period from seedling to maturity of potato
- **Timing:** at least 3 times per growing season

Fig.8 "Trawling" Survey

b) Planting potato trapping zones to trap Colorado beetle

More than 200 Colorado beetle trapping fields have been set up in key areas:

- the pest occurrence areas
- the surrounding high risk areas
- the border counties and cities
- along the main traffic routes to inland

Potatoes were planted earlier for monitoring and concentrate control.

Fig.9 One of the potato trapping fields

3. Supporting Infrastructure

a)   Pytosanitary Legislation and Regulation

◆**Regulation on plant quarantine (Adopted in 1983, last revision in 2017)**

◆ **Standards:**
National standard (GB/T 23620-2009)
Industrial standards (NY/T 3267-2018, SN/T 4984-2017, SN/T 1178-2003)
Local standard (DB23/T 2222-2018)

◆ **Technical guide for Colorado beetle management**

◆ **Local Emergency prevention and control protocol for Colorado beetle**

ISPMs implemented:

- ISPM6 Surveillance,
- ISPM8 Determination of pest status in an area,
- ISPM9 Guidelines for pest eradication programmes,
- ISPM17 Pest reporting.

b) Resources Guarantee

An environment with government-led and all stakeholder engaged has been formed that both the financial and human resources being guaranteed.

- MARA of China: USD 2.4million.

- Local government: USD 2million.

- The pest prevention and control has been incorporated into the government work plan.

- A clear responsibility division, reward and punishment mechanism has been established.
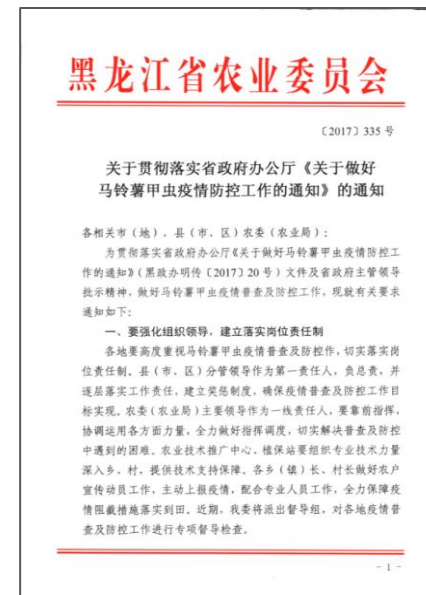

Fig.10 One of the government documents to improve the prevention and control of Colorado Beetle

c) Training

Provincial level: annually.

Cities and counties level: more than 286 training courses.

A Colorado beetle breeding net house has been built for on-site training.

Fig.11 Provincial level training course

Fig.12 The trainees in front of the Colorado beetle breeding net house

d) Supervision and Auditing

MARA of China: 8 experts groups to supervise and guide the local surveillance and prevention work.

The local commission of agriculture: 45 investigation and supervision groups.

Fig.13 Prevention and control effectiveness and risk assessment meeting

Fig.14 Experts group from MARA

e) Communication and stakeholder engagement

More than 600,000 copies of various types of publicity materials has been designed.

6 reports in Raohe county came from farmer's report last year.

Fig.15 Different kinds of publicity materials

Fig.16 Communication of the identification of Colorado beetle in rural area

f) Pest Diagnostics

Dr Runzhi Zhang's team

Institute of Zoology，Chinese Academy of Sciences

1996，Beijing

2015，Heilongjiang

Fig.17 Introducing the status of Colorado beetle for high level

Fig.18 Introducing the identification tips of Colorado beetle for technical person

g) Information collection and management system

- Mobile application for effective data collection.

- Online surveillance system for data analysis and reporting.

- RS (remote sensing) technology application to locate potato fields accurately.
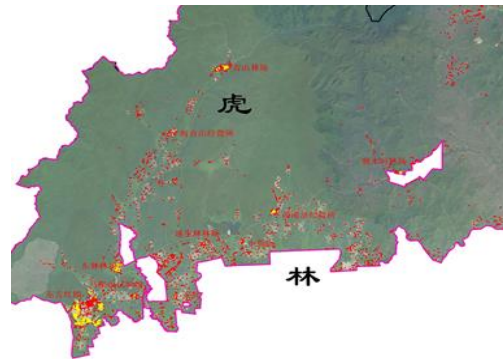

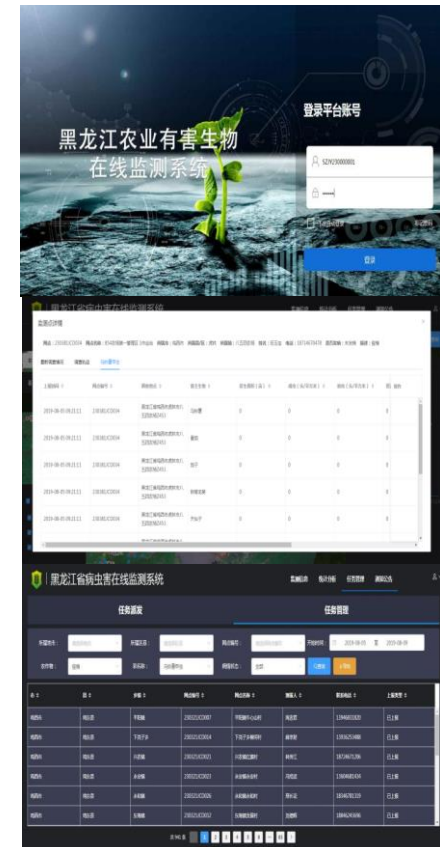Fig.19 Mobile application

Fig.21 RS research

Fig.20 Online surveillance system

POSITIVE EXPERIENCE

- ✓ **Powerful administrative attention and guidance.**
- ✓ **Scientific technology training.**
- ✓ **Extensive and practical publicity.**

AREAS FOR IMPROVEMENT

Fig.22 Colorado Beetle by Runzhi Zhang

- ✓ **Developing new technology products for Colorado beetle monitoring**

NEEDS

Do the transboundary pests have commonality?

What's their key prevention points?

Need to improve pest status information exchanging, facilitate phytosanitary technology sharing and strengthen research cooperation in the field of transboundary pest control.