

Effects and Experiences of Integrated Control of Citrus Huanglongbing Performed in the Last Decade in Guangxi, P. R. China

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Abstract: Citrus Huanglongbing is one of the most destructive diseases in citrus industry worldwide. Effective control of Citrus Huanglongbing is the most important task in citrus producing areas infected by Huanglongbing. In Guangxi, P. R. China, integrated control of Citrus Huanglongbing had been performed throughout the whole province for ten years, and numerous of successful experiences had been achieved. By carrying out integrated control of Huanglongbing during the last decade, the size of Guangxi citrus industry reached to the second place from the seventh in P. R. China. Here we introduced and shared the effects and experiences of the integrated control of Citrus Huanglongbing performed in Guangxi.

Keywords: Huanglongbing; integrated control; strategy; experience; Guangxi

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Guangxi is the second largest citrus production center in China, with 293,000 hm² of citrus plantation and 4,695,700 tons of fruits produced in 2014. Successful development of citrus industry in Guangxi was greatly helped by the integrated Huanglongbing management scheme.

In Guangxi, Huanglongbing was first reported in Yulin region, southern Guangxi in 1930s. In 1960s and 1970s, prevalence of Huanglongbing was reported in Qinzhou and Nanning, the south and center of Guangxi, respectively. The Huanglongbing was found even in Guilin, the northern Guangxi in 1980s. To 2006, the citrus in 70 counties of 14 cities was severely infected by the Huanglongbing. All of citrus orchards developed in 1970s and 1980s in the south and center of Guangxi was destroyed, with more than 67,000 hm² of plantation and over 1.5 billion dollars directly economics loss.

Since 2005, Department of Agriculture of Guangxi initiated integrated disease management scheme to

control Citrus Huanglongbing, which effectively reduced the number of citrus plants infected by the disease. The Huanglongbing infection rates observed at the end of year were at 6.45%, 3.9%, 2.16%, 1.8%, 1.5%, 1.2% and 0.8% from 2005 to 2011, respectively. Therefore, citrus cultivation area and production in Guangxi gradually increased from 141,270 hm² with 1,876,800 tons of production in 2005 to 293,000 hm² with 4,695,700 tons of production in 2014. In ten years, the size of Guangxi citrus industry reached to the second place from the seventh in P. R. China.

We have obtained many experiences on the control of Citrus Huanglongbing with integrated management scheme in the past decade.

1. Government support

(1) Task teams

Guangxi set up an official Huanglongbing control team in 2005, with Mr. Zhang Mingpei Zhang, head of the Department of Agriculture of Guangxi in charge of

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the team. The team took the responsibility to lead the control of Huanglongbing in the whole province. In the cities and counties, local government also set up the relevant teams with division directors as the head of team and took the scientist form from relevant research organizations into the team to provide the professional guidance. In the booklet Notice on Intensifying Integrated Control of Citrus Huanglongbing issued by Guangxi people's Government in February, 2007, it was stated that control of Citrus Huanglongbing should be treated as one of the important mission of the government.

(2) Policy

Government official of Guangxi Province issued notifications on performing the integrated management to control Citrus Huanglongbing, and announced to intensify the supervision of the propagation and transportation of citrus nursery tree. Integrated control of Huanglongbing was one of the seven major projects in the development plans of Guangxi citrus industry. The government provided the subsidies to the farmers who removed Huanglongbing-infected citrus trees and planted virus-free citrus nursery trees.

(3) Financial support

Ministry of Agriculture and all levels of governments of Guangxi supplied more than 15 million dollar for the construction of citrus virus-free nursery tree propagation system and also provided the funding on training, publicity and printing the technique booklet for control of Huanglongbing.

2. Technologies for control of Huanglongbing

(1) Scientific information exchange

Several seminars for plant protection and three national wide seminars on Huanglongbing control have organized to get experts together from the Citrus Research Institute of Chinese Academy of Agricultural Sciences (CAAS-CRI), South China Agricultural University, Huazhong Agricultural University and Hunan Agricultural University to exchange the concepts, ideas and information, as well as to develop strategies on Huanglongbing.

(2) Monitoring and control of psyllids

Set up more than 30 citrus psyllid monitoring sites throughout the province. Promote the techniques of pinching off new flushootes and control of shootflushing to reduce the psyllid infesting. Use power smoke sprayers to improve the efficiency of chemical application.

(3) Extensive survey and timely removal of Huanglongbing-infected trees

Regularly inspect the orchards to survey the infection of Huanglongbing. Remove diseased citrus trees as early as possible.

(4) Propagating and planting virus-free citrus nursery trees

Monitor the citrus nursery trees produced in Guangxi with Huanglongbing pathogen specific PCR. Prohibit the trading of Huanglongbing-infected nursery trees.

3. Improve farmers' awareness and knowledge in the control of Huanglongbing

Impart field diagnosis, epidemic pattern, transmission pathways and integrated control of Huanglongbing, and psyllid control to farmers by holding training classes, distributing illustrated and easily understood technical materials, writing blackboards, posting technique slogans, providing technique consultations, playing knowledge discs, guiding on the spot of orchards and communicating through newspapers, televisions and broadcast radios and the like.

4. Innovation of new control pattern

(1) Encourage villagers to control by themselves by self-made rules and regulations

Regulate Huanglongbing control by village rules and regulations, which make farmers supervise between each other to guarantee no diseased trees left.

(2) Set up citrus cooperation societies that can realize concordant control of the Citrus Huanglongbing in large scale

Training control techniques and intensively spraying pesticide by village-level citrus (下转第 41 页)

淋根,667m²使用 2~3 kg,利于柑橘的根系的快速生长,补充土壤有机质,加快土壤固化养分的释放。

3 结论

作物健康理疗技术具有广谱高效、绿色环保、无公害、无残留和预防为主等特点,适合现代农业的发展,能够解决广西柑橘种植中遇到的多种逆境带来的产量、品质等问题,帮助种植户轻松管理、提高柑橘品质 and 经济效益,同时也保证柑橘果品的安全性,提升广西柑橘的国际竞争力。

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cooperation societies.

(3) Organize a professional control team to carry out control of citrus psyllids regularly

Intensively spray pesticide to control citrus psyllids regularly by the professional control team.

5. Supervise and examine in routine to form long-term effectiveness mechanism of integrated control of Huanglongbing

The member units of Huanglongbing control leader

team of Department of Agriculture of Guangxi examined local Huanglongbing control progress together or in groups to make sure that various jobs of integrated treatment of Huanglongbing can be implemented stably for a long time.

The integrated control of Citrus Huanglongbing in Guangxi has been carried out according to basic agricultural conditions of Guangxi. Some experiences in Citrus Huanglongbing control are worthy of reference to other regions at home and abroad. We also hope other research groups can share their progresses and experiences of the control of Citrus Huanglongbing.

广西近十年柑橘黄龙病综合防控成效与经验

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摘要:柑橘黄龙病是柑橘生产上的毁灭性病害之一。有效防控柑橘黄龙病是黄龙病疫区柑橘生产中最重要的任务。近十年, 广西省致力于在全省范围内实施柑橘黄龙病综合防控, 并在此过程中获得了很多有用且宝贵的经验。通过近十年柑橘黄龙病综合防控的实施, 广西柑橘产业规模从全国第七位跃居全国第二位。本文主要介绍并分享广西近十年柑橘黄龙病综合防控中取得的成效和经验。

关键词:黄龙病; 综合防控; 策略; 经验; 广西

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