

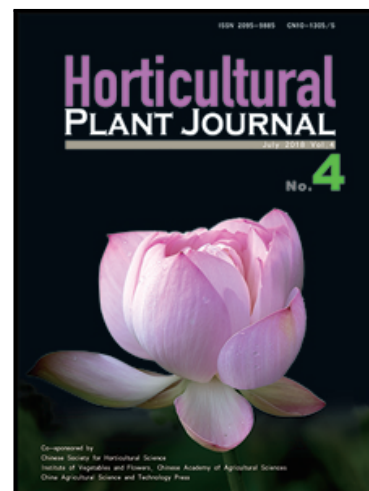
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Breeding for Resistance to Tomato Bacterial Diseases in China: Challenges and Prospects

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ABSTRACT

Four bacterial diseases including bacterial canker caused by *Clavibacter michiganensis* subsp. *michiganensis*, bacterial speck caused by *Pseudomonas syringae* pv. *tomato*, bacterial spot caused by at least four *Xanthomonas* species, and bacterial wilt caused by *Ralstonia solanacearum* are among the most devastating diseases in tomato (*Solanum lycopersicum*) production in China. However, almost no commercial cultivars currently growing in the country are resistant to these four bacterial diseases because little effort has been devoted to breeding for resistance. In addition, the existence of great natural variation in each pathogen and the quantitative inheritance of resistance add to the difficulties of developing cultivars with resistance to these diseases. In the past 20 years, molecular markers tightly linked to genes conferring resistance to these four bacterial diseases have been identified or gene-based markers have been developed, which may circumvent some of the problems associated with phenotypic selection for resistance to multiple bacterial pathogens and races. Here we present a review on current status of studies on these diseases and discuss the promise of new technologies in breeding for resistance to these bacterial diseases in China.

Keywords

Tomato; Bacterial disease; New breeding technology

1. Introduction

Tomato (*Solanum lycopersicum* L.) is one of the most consumed vegetables worldwide. Due to its economic importance and the potential health benefits, both the world harvested area and the total production increased approximately 22.8% and 63.5%, respectively, from 2001 to 2016 (<http://faostat.fao.org>). China is the world's leading tomato producer with approximately 20.9% (999 312 hm²) of world's harvested area and 31.8% (5.631×10^{10} kg) of world's production in 2016, which increased 36.9% and 134.6%, respectively, compared to 2001. Although the nationwide average yield (56

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