AVRDC

Tomato grafting creates economic opportunities for farmers in Vietnam

Tomato farmers in Southeast Asia can lose 100% of their crops due to diseases and wet soils. The World Vegetable Center (AVRDC) researched grafting as a possible technical solution to these constraints through a series of projects funded by DFID and other donors in the early 1990s, when the department also supported the establishment of an International Bacterial Wilt Symposium in 1992. By 2002, tomato grafting was being rolled out across Vietnam in an attempt to increase productivity and security for farmers. AVRDC decided that a decade after introducing the technique it would be useful to conduct an impact evaluation of the technology in Vietnam, the results of which show that tomato grafting helps farmers overcome production constraints, increase yield and generate more income.

Introduction

Waterlogged soils and bacterial disease have long been a problem for tomato producers in Vietnam's hot, wet climate, sometimes leading to 100% yield loss. This can have a devastating impact on a farmer's income and livelihood. Tomato grafting is a growing technique which involves combining a bacterial wilt-resistant, flood-tolerant rootstock with a high-yielding tomato scion. It provides farmers with a means to overcome their environmental constraints.

AVRDC began tomato grafting research experiments in 1992 and in the mid-1990s developed training courses on how to use this growing technique in practice, held at its headquarters in Taiwan. The technique was introduced in northern and southern Vietnam after scientists from the Fruit and Vegetable Research Institute (FAVRI) and the Potato, Vegetable and Flower Research Center (PVFC) attended an AVRDC training course in 2002. Both partners evaluated the technique and disseminated it to farmers through television programs, brochures, guides and demonstrations.

Tomato grafting research funded by DFID has led to estimated benefits of US $41.7m in profits for Vietnamise farmers in the Lam Dong province.

Research into Action

Adoption of AVRDC research was rapid in Lam Dong province in the south of Vietnam, where the number of farmers using grafted tomatoes began to steadily increase after 2002. Uptake was slower in the Red River Delta in the north, where disease problems are not as acute but by 2009 the use of grafted tomatoes there was on the rise.

AVRDC conducted a survey in 2012 with 225 tomato farmers in Lam Dong and 75 tomato farmers in the Red River Delta to evaluate the impact of grafting on their incomes and activities.

Impact

The survey results showed that 100% of the tomato farmers in Lam Dong and 48% of the tomato farmers in the Red River Delta adopted the use of grafted seedlings (As demonstrated in Figure 1). In Lam Dong the farmers used tomato variety Vimina as a rootstock for its resistance to bacterial wilt, while in the Red River Delta, eggplant variety EG203 was used as it tolerates waterlogging, the major constraint there.

A comparison of profits between grafted and non-grafted tomato was made for the Red River Delta. **The average yields (81.4 t/ha) and farm gate prices (US$0.41/kg) of grafted tomatoes were significantly greater, by 31% and 39%, respectively, compared with non-grafted tomatoes.** Clearly, in places where bacterial diseases are a problem, tomato grafting offers significant monetary benefits to farmers because it commands a higher price and increases yield.

Grafted tomatoes had a benefit-cost ratio of 4.6 compared to 3.5 for non-grafted tomatoes. For every US$1 invested, farmers who adopted grafting could expect US$1.23 in income (revenues minus costs). In Lam Dong province, estimated total profit for farmers planting grafted tomato was US$41.7 million higher than if the same area had been planted with non-grafted tomato[1].

Wider Environment

Grafted tomatoes are now planted on more than 6000 hectares in Lam Dong province. In the Red River Delta, FAVRI has established nurseries to ensure farmers have access to grafted seedlings.

The benefits of tomato grafting can be achieved only if soil-borne diseases or flooding actually constrain tomato production, as grafted seedlings are more costly than non-grafted seedlings.

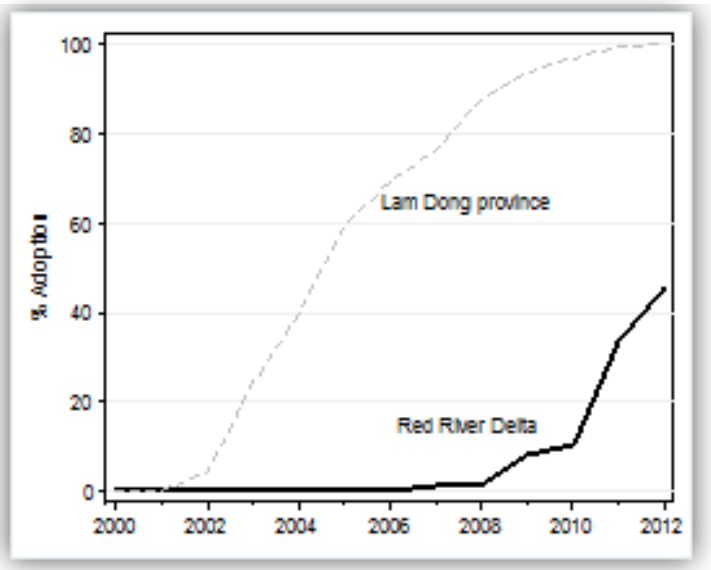

Figure 1 - Adoption of tomato grafting in Lam Dong province and the Red River Delta

Next Steps

AVRDC is disseminating tomato grafting practices in Indonesia, Bangladesh, Thailand and other countries with locations suitable for the successful application of the method. Further research will focus on rootstocks resistant to bacterial wilt, Fusarium wilt and root-knot nematode; alternative rootstocks; growth, yield, and fruit quality of grafted tomato; and the role of private sector nurseries in the production and marketing of grafted seedlings.

Key Contacts

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Further Information

Visit www.avrdc.org for more information.

[1] Genova C, Schreinemachers P, Afari-Sefa V. 2013. An impact assessment of AVRDC's tomato grafting in Vietnam. AVRDC – The World Vegetable Center, Shanhua, Taiwan. Publication number 13-773. 52 p. (Research in Action; no. 8).
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