

Research Application Summary

Biotic constraints to passion fruit production in central and eastern provinces of Kenya

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Abstract

Passion fruit is an important crop in Kenya for income generation. However, passion fruit production faces major challenges due to pests and diseases that have led to yield losses of 50-100%. To support development of effective integrated management measures, a survey was carried out in July 2010 in Central and Eastern provinces. Results showed that >70% of farmers in the surveyed area had abandoned passion fruit farming due to dieback, fusarium wilt, brown spot, phytophthora canker and woodiness virus infections and pests like thrips and mites.

Key words: Dieback, Kenya, passion fruit, pests/diseases, survey

Résumé

Le fruit de la passion(ou passiflore) est une culture importante au Kenya pour la génération de revenus. Cependant, la production de ce fruit fait face aux défis majeurs à cause des parasites et des maladies qui ont conduit à des pertes de rendement de 50-100%. Pour soutenir le développement de mesures efficaces de gestion intégrée, un sondage a été réalisé en Juillet 2010 dans les provinces centrale et orientale. Les résultats ont montré que plus de 70% d'agriculteurs dans le milieu étudié ont abandonné l'agriculture de passiflore à cause du dépérissement, de la fusariose, de la tache brune, du chancre de Phytophthora et des infections virales et des parasites comme les Thysanoptères et les acariens.

Mots clés: Dépérissement, Kenya, passiflore, parasites / maladies, enquête

Background

In the recent past, passion fruit production in Kenya has been on the decline with major industrial processors operating below installed capacity or importing pulp, while fruit exportation has come to near standstill. This scenario is mainly attributed to effects of pests and diseases. Research is needed to develop effective and sustainable control measures.

Literature Summary

Passion fruit (*Passiflora edulis* Sims) is the third most important fruit crop in Kenya after mango and avocado in terms of foreign exchange earnings (Kahinga *et al.*, 2006). However, its production faces major challenges. Global climate change has had an impact on productivity due to erratic rainfall patterns, prolonged drought periods, flooding and severe effects of pests and diseases. These impacts have been most profound in Kenya where most passion fruit producers are small scale farmers with inadequate resources to respond (Wasilwa, 2007).

Diseases have contributed most to the decline of the Kenyan passion fruit industry. A recent stakeholders meeting ranked diseases as the most serious threat in addition to scarcity of certified seedlings and prolonged drought. In 2007 about 5193 ha were under passion fruit cultivation, yielding 71000 tons worth Ksh 2.1 billion; in 2008 less than 2800 ha were farmed yielding an estimated 33800 tons worth about Ksh 1.05 billion (HCDA/MoA, 2009 unpublished). These data suggest a massive 50 % decrease across all parameters within a single year.

Reduced production has adversely affected the livelihoods of growers and industrial processors, with many operating below installed capacity, e.g. SANMANGO company which had capacity to process 100 ton/week was processing less than 25 ton/week, while others such as Delmonte were importing pulp from South Africa and Brazil (Otipa, 2009).

The key diseases include Fusarium wilt, Phytophthora canker, brown spots and woodiness virus (Mbaka *et al.*, 2006) and a more recently emerged one known as dieback. There is urgent need to address these diseases. Research is needed to support development of effective control measures.

Research Approach

A survey was conducted to determine the major constraints to passion fruit production in eight key growing districts (Muranga North, Muranga South, Kirinyaga East, Kirinyaga West, Embu East, Embu West, Meru Central and Imenti south) within Central and Eastern provinces of Kenya. A minimum of 10 farmers were selected from each district. Farms were randomly sampled at an average spacing of 4 km. Questionnaires were administered to farmers with >100 passion fruit plants. Photos were used to help farmers identify diseases on their farms. Orchards were visited to identify the extent of any disease present. Diseased materials were collected for isolation and identification of pathogens in the laboratory. A detailed analysis of farmer practices was made to assess their appropriateness.

Research Application

The results of this survey confirmed diseases as a major limiting factor to production. Although grafting of purple on yellow root stock has reduced Fusarium wilt incidence, the disease was still a major threat. Dieback was identified as the most serious threat as it rapidly kills plants and had no known control measure. Furthermore, the etiology of dieback was not fully understood, which complicates efforts to develop control strategies.

This research has established the current status of the diseases hindering passion fruit production in Eastern and Central Kenya. The results are being used in an ongoing research activities to develop and test management options for the dieback disease. These results justify need for increased research effort on management of Fusarium wilt, which was previously thought to be effectively controlled through grafting.

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