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Multi-criteria Analysis for Identifying Appropriate Pest Management in Tomato Production in Chiang Mai Province, Thailand

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Abstract

Pest management practised in commercial small-scale vegetable production has widely been criticised due to associated negative effects of pesticides use. In northern Thailand this issue has recently received increasing attention and alternatives to conventional production systems have evolved. These new approaches focus on differentiated spread of risks through the employment of (integrated) pest management as well as associated adaptations of production considering external conditions. Still, there is a lack of holistic scientific studies comparing the new approaches to conventional practices. The framework of the present study combines an economic analysis with a multi-criteria analysis. This aids in analysing the reasoning in qualitatively different pest management schemes in four small-scale tomato production systems in Chiang Mai Province, Thailand. Special attention is hereby given to the toxicity and environmental impacts of the applied pesticides as well as to associated production risks, financial risks, market risks and health risks in tomato production. In total 71 tomato producers were interviewed in pre-structured interviews. The obtained data was processed with the software package STATA. The results show a conventional open field tomato production system with comparably low profits of 9,886 baht ha⁻¹month⁻¹ and the highest market risk, highest health risk and highest environmental impact of all analysed tomato production systems. An open field tomato production system, technically supported by Thailand's Royal Project Foundation, presents the highest profits of 42,297 baht ha⁻¹month⁻¹. However, the most efficient way of combining economically feasible pest management with the reduction of environmental impact and of other associated risks presents a tomato production system using transparent plastic roofing. The Royal Project Foundation also supports this group of tomato producers.

Keywords: EIQ, IPM, MCA, Pesticide use, Risk assessment