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"Competing pathways for equitable food systems transformation: Trade-offs and synergies"

Integrated pest management is cost-effective and successfully reduced insect pests of eggplant (*Solanum melongena* var. pink ravaya) in two agroecological zones in Ghana

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Abstract

Increased public concern over the health and environmental implication of the extensive use of synthetic pesticides to control insect pests have necessitated the need for alternative eco-friendly options. Therefore, this research was conducted to evaluate cost-effective pest management modules that could guarantee the sustainable production of *Solanum melongena* (eggplant) in the deciduous forest and coastal savannah agroecological zones of Ghana. The experiment evaluated four treatment modules [chemical intensive, less-risk, integrated control (IPM) and no spray (control)] for two cropping seasons; major and minor rainy seasons of 2020/2021. Eggplant seedlings raised in insect-proof net were transplanted onto the treatment plots and data on the abundance of insect pests and natural enemies were collected weekly, beginning two weeks after transplanting. The yield was recorded at harvest and the economics of each module was assessed for each location and season. The results showed that the abundance and dynamics of key insect pests varied across treatment modules, seasons and geographical locations. The IPM treatment had the lowest abundance of all pests (thrips, eggplant fruit and shoot borer, whiteflies, mites, aphids, leafhoppers and grasshoppers) and the highest yield and cost-benefit ratio as opposed to the control. The abundance of insect pests and eggplant yield were lower in the coastal savannah than in the deciduous forest zones for both seasons. Incorporating agroecological, seasonal and financial variability information in pest control programmes can improve the sustainability and adoption of integrated pest management programmes. This information can be used to select appropriate location-specific pest management modules for use in vegetable production in Ghana and the entire sub-region.

Keywords: Agro-ecological zone, cost-benefit ratio, integrated pest management, key insect pests

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