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## Farmer's decision making toolbox for *Plutella xylostella* (L.) (Lepidoptera: Plutellidae) management on fresh market cabbage

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**Statement of the Problem:** In absence of the pest economic thresholds, farmers apply insecticides prophylactically based on calendar-sprays with no regard to pest density. In addition, there tends to be no clear guidelines for the integration of the insecticides with the natural pest control. Consequently, the impact of the insecticides on Biological Control (BC) agents (compatibility), the impact of the BC agents on the pest (levels of parasitism), seasonality of pest and BC agent's populations and the action thresholds (weekly counts) of the insect pests are not taken into account in pest management decision making. This practice constitutes a major threat to biodiversity in agroecosystem and the surrounding environments.

**Methods:** Population dynamics of *Plutella xylostella*, an important insect pest of cabbage and its dominant parasitoid, *Cotesia vestalis* (= *plutellae*) were investigated on cabbage treated with conventional and a selective insecticide under three insecticide treatment routines. The data was used to develop a simple framework to develop insect pest thresholds and estimate yields through integration of insect density, yield loss ratios, technical efficiencies and damage abatement factors. In addition, the impact of a conventional and a selective insecticide on the BC agents was investigated.

**Findings:** *Plutella xylostella* populations varied between the seasons, the conventional and a selective insecticide and the insecticide treatment routines. *P. xylostella* incidence correlated well with the effective yields and the mean action threshold for the optimal cabbage yields was estimated at as single larvae per plant. Parasitism of *P. xylostella* was higher in insecticide free and selective insecticide treated crop compared to conventional insecticides.

**Conclusion:** The results indicated that, while cabbage cannot be cultivated without applications of insecticide against *P. xylostella* during certain periods of the year, adoption of action thresholds reduce number of sprays. In addition, application of selective insecticides reduces the insecticides impact on the parasitoids population.

### Biography

Mxolisi Arnold Stemele is an Entomology Lecturer at the University of Fort Hare, Eastern Cape, South Africa. His research interest includes biological control, host plant resistance, toxicology, insect-plant interaction chemical ecology, insect pathology and molecular approaches in entomological research. He is currently working on a project 'Decision making tools for farmers in pest management' and 'Molecular characterization and DNA barcoding of the Lepidoptera stem borers on cereal crops and natural vegetation'.

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