



Longitudinal Assessment of *Aphidius colemani* Parasitoid Efficacy for Aphid Management in Smallholder Cabbage Systems of the Amathole District

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ABSTRACT

Background: Smallholder cabbage production in South Africa is severely constrained by aphid infestations, leading to significant yield losses and over-reliance on synthetic pesticides. The potential of the parasitoid wasp *Aphidius colemani* as a biological control agent within these specific agro-ecological and socio-economic contexts remains poorly quantified.

Purpose and objectives: This longitudinal study aimed to assess the field efficacy and seasonal persistence of inoculative releases of *A. colemani* for aphid suppression in smallholder cabbage systems, and to evaluate its impact on crop yield and marketable produce.

Keywords: *Biological control, smallholder agriculture, *Aphidius colemani*, integrated pest management, Southern Africa, parasitoid efficacy, on-farm research*

Article Highlights

- 68% reduction in peak aphid densities with parasitoid releases
- 31% increase in marketable yield in treatment plots
- Parasitism rates exceeded 40% for 6-8 weeks post-release
- Longitudinal on-farm study across multiple growing seasons

Methodological Note

Repeated-measures on-farm experiment analysed using generalized linear mixed models with robust standard errors for inference.

This study demonstrates the practical efficacy of biological control in resource-constrained agricultural systems.

ABSTRACT-ONLY PUBLICATION

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