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Botanical Alternatives for the Management of Fall Armyworm: Efficacy of *Urtica dioica*-Derived Biopesticide

Kofi Frimpong-Anin[1,2], Ernest Baafi[1], Kwesi Atta Snr. Aidoo[1], Ernestina N. Awarikabey[1], Agbesi K. Keteku[1], Franklin Bosompem[1], Richard Y. Owusu[1] and Douglas Antwi[1]
[1]SIR-Crops Research Institute, P. O. Box 3785, Kumasi, Ghana
[2]Department of Plant Resources Development, Faculty of Natural Sciences and Environmental Management, CSIR-College of Science and Technology, Ghana
Corresponding Author: Email: nanakofy@yahoo.com

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ABSTRACT

Objectives: To evaluate the field efficacy of *Urtica dioica*-based botanical insecticide, *Adamfo Pa*, for managing fall armyworm (FAW) across the Forest and Transitional Ecological zones of Ghana, with the broader goal of expanding biopesticide options within integrated pest management strategies.

Methodology and Results: Maize plots were treated with three doses of *Adamfo Pa* – 300, 400, 500 mL/100L water), Bypel® (*Bacillus thuringiensis*) and water as controls, at weekly and bi-weekly intervals. FAW larval survival, incidence, maize leaf damage and yield were evaluated. The 500 mL/100 *Adamfo Pa* performed comparably to Bypel®, with both treatments showing significantly lower larval survival rates, FAW incidence, and leaf damage scores than the lower doses of *Adamfo Pa* and the untreated control. Weekly application intervals provided superior pest suppression compared to bi-weekly applications across all measured parameters. Highest cob weight and grain yield were recorded in plots treated with the high-dose *Adamfo Pa* and Bypel® applied weekly.

Conclusion and Application of Results: This study demonstrated that *Adamfo Pa*, a *Urtica dioica*-based biopesticide, is effective for fall armyworm (FAW) management in maize, particularly at the high dose of 500 mL/100 L applied weekly. Its efficacy was comparable to the commercial Bt-based insecticide, Bypel®. The findings highlight *Adamfo Pa* as a potent botanical alternative within integrated pest management (IPM) programmes. This offers farmers an eco-friendly option that reduces reliance on synthetic insecticides for the management of the pest. It also diversifies biopesticide choices beyond neem extracts. Its adoption can enhance sustainable maize production among smallholder farmers, mitigate insecticide footprint in agricultural landscapes, and slow resistance development in FAW populations. Further multi-season trials could strengthen evidence of its yield-enhancing potential and guide broader commercialization.

Key words: Bio-efficacy, botanical, fall armyworm, leaf damage, Maize, pest incidence,