



Development and Study of The Efficiency of Automatic Fruit Fly Trap

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Abstract

Fruit fly are major agricultural pests that cause serious damage to fruit crops, particularly thin-skinned fruits such as oranges. A survey conducted in a 30-rai Shogun orange orchard found annual losses of approximately 300,000 baht (4–5% of the cultivated area). Conventional traps using Methyl eugenol, Protein hydrolysate, and sticky glue but required frequent maintenance and showed limited efficiency. To overcome these limitations, an automatic fruit fly trap was developed using Methyl eugenol to attract males and Protein hydrolysate to attract females. The prototype was improved through three generations. Generation 1 combined a drip pump, fan, and Blacklight, capturing 3 times than the conventional trap. Generation 2 introduced a redesigned structure, a Mist maker for improved Methyl eugenol dispersion, and yellow sticky boards, increasing captures, capturing 3.4 times than the conventional trap. Generation 3 replaced the Blacklight with an automatic Protein hydrolysate refilling system, optimized the Mist maker position, and added internal and external glue insert channels, achieving captured insects 3.8 times than the conventional trap. These results demonstrate that continuous prototype improvement significantly enhanced trapping efficiency and highlights the potential of the automated trap to reduce crop losses, lower labor requirements, and support sustainable fruit production.

Keywords: Fruit Fly, Methyl eugenol, Protein hydrolysate