# About the Combination of Control Tools Against the Oriental Fruit Fly Using a Metapopulation Approach

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**Abstract**

The oriental fruit fly, *Bactrocera dorsalis*, is a major invasive pest and classified as a quarantine pest by the European Union. First recorded in La Réunion in April 2017, it is now established and causes serious damage, particularly in mango orchards. Due to the high biodiversity of La Réunion, chemical control is highly restricted, so only non-chemical tools can be used, such as the Male Annihilation Technique (using Methyl-eugenol traps) and soil entomopathogen fungi applied via irrigation systems to target the pupal and adult stages. Additionally, the Sterile Insect Technique (SIT) has been under investigation since 2020. It consists of mass rearing, irradiation, and release of sterilized insects to compete with wild populations, reducing reproduction rates.

All these control approaches have been studied using mathematical models [1–3]. The aim of this talk is to present new mathematical results, illustrated with simulations, where the combination of these control tools is analyzed to derive optimal strategies in space and time.

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