

OPTIMUM DOSE OF GINGER ROOT OIL TO TREAT STERILE *CERATITIS CAPITATA* (WIEDEMANN) (DIPTERA: TEPHRITIDAE) MALES.

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Background: The sterile insect technique (SIT) is widely used as part of an integrated approach to reduce field populations of the Mediterranean fruit fly (*Ceratitidis capitata*, Diptera: Tephritidae). Aromatherapy based on exposure to ginger root oil (GRO) volatiles is known as a method to significantly improve the sexual performance of sterile medfly males, and is being used in many mass-rearing facilities around the world. However, the optimum dose of GRO is not well defined.

Methods: This work evaluated in laboratory cages four different doses of GRO and a control (0, 0.1, 0.25, 0.5, and 0.75 ml/m³), and two different methods to hold flies prior to release (paper bags and plastic cages). The objective was to find the lowest dose that provides optimal improvement in mating performance of sterile males when competing with wild males for wild females and optimal reduction in fertility of wild females. Egg hatch, copula duration, the Relative Sterility Index (RSI), and a Competitiveness (C) value (based on RSI) were calculated for each treatment to assess male sexual performance and induction of sterility.

Results: The method used to hold flies did not influence the aromatherapy effect. The mean time spent by wild females in copula with wild males was significantly longer than with sterile males for all treatments, except when sterile males were treated with 0.1 ml of GRO/m³. Among all doses studied, the dose 0.1 ml of GRO/m³ reached the highest levels for both RSI and induced sterility, and was not statistically different from the 0.25 and 0.5 GRO/m³ doses.

Conclusion: The flies can be treated aromatically with ginger root oil in either paper bags or ventilated plastic cages. It is recommended to apply the lowest dose, 0.1 ml of GRO/m³, because it showed the best cost/benefit ratio when used in the Mediterranean fruit fly SIT programme in the San Francisco River Valley, Brazil.

Keywords: Aromatherapy, Sterile insect technique, Mediterranean fruit fly, Medfly, GRO.