

Poster: Sterile Insect Technique

Overwintering of Mediterranean Fruit Fly Adults in Dalmatia and Implications to Current Strategy of SIT Suppression Program in Neretva Valley

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Background: Suppression of Mediterranean fruit fly or medfly, *Ceratitidis capitata* Wied. (Diptera, Tephritidae) in the Neretva valley integrate Sterile Insect Technique (SIT) with other control methods. The release of sterile medfly males begins in the late April and continues through November. This strategy was developed 15 years ago when an area-wide control program supported by FAO/IAEA was initiated. The release strategy was based on available data that the pest was overwintering only as larvae in the fruit of host plants at that time.

Methods: In order to optimise the release strategy, we analysed available data from annual reports for 2014-2017 on medfly overwintering in the Neretva valley: i) emergence of overwintering larvae from infested mandarin fruits during winter, ii) detection of adults at hotspots from April to June and iii) available and suitable host plants fruits in late winter. In addition, we analysed the above data and complement it with results of experiments on overwintering of adults conducted as a part of the EU-funded project FF-IPM ("*in-silico* boosted, pest prevention and *OFF-season* focused IPM against new and emerging fruit flies" <http://fruitflies-ipm.eu>) during winter and spring 2019-2021.

Results: Multi-year data from the Neretva Valley confirm that the medfly overwinters mainly as a larva in fruits, followed by pupation in the soil and emergence of adults during April and May. Several captures of adult females in 3C lure traps were recorded during early April at hotspot locations in open fields, as well as findings of fully developed larvae in kumquat, *Fortunella japonica* in early April. Experiments on the *OFF-season* survival potential of adults fill in the gaps in our knowledge of medfly overwintering capacity, showing that a small percentage of adults can survive through April in open fields, while adults in basements in urban areas remained alive through May. In most experiments, females outlive males.

Conclusion: Most of the medfly population overwinters as larvae in fruit, and adult emergence least during April and May. Recent experiments show that a small but very important percentage of adults are able to overwinter in both open field conditions as well in protected spaces such as basements in urban areas. Mandarins and fresh fruits of kumquat represent quality hosts in which the pest will reproduce and establish a population in the early spring. Basements in urban areas are additional hotspots for medfly overwintering. Therefore, the release strategy should be optimized by earlier release of sterile males concentrating on hotspots in open fields and urban areas.

Keywords: Medfly, Sterile Insect Technique, overwintering,