"FF-IPM: In-silico boosted, pest prevention and off-season focused IPM against new and emerging fruit flies", a recently-launched European Union Project

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The ambition of the FF-IPM project is to protect the European horticulture and trade from the current and imminent threats posed by selected emerging (existing) and new (invasive) frugivorous fruit flies. It targets three species of fruit flies (Tephritidae) that cause significant losses in the production and marketing of fresh fruit worldwide. The Mediterranean fruit fly (Ceratitis capitata), which in recent year is threatening temperate regions of Europe, and the "oriental" (Bactrocera dorsalis) and peach fruit flies (B. zonata), which are important invasive species, and an imminent threat to Europe's fruit production. The risks of arrival, establishment and range expansion of these invasive fruit flies (FF) are expected to escalate because of global climate change, increased trade and human mobility. In addition, the ban of neonicotinoids, which is one of the main control tools against FF in Europe, poses an additional burden on fruit growers in Europe. Substantial knowledge has been accumulated to date on the biology and management of various FF species, providing a solid starting base for the FF-IPM project and offering unique synergy opportunities. However, most of the FF-relevant R&D was conducted outside Europe, focusing on closely related but different FF species, targeting industrial-scale horticulture and designing quarantine and pest protection systems suitable for regulatory uniform macro-regional scales (USA, Australia). To address the European needs (small size, scattered farms, operated under diverse socioeconomic and regulatory frameworks), FF-IPM will build on existing knowledge, identify and fill the critical information gaps, boost regional FF prevention by developing new and enhancing the existing interception and detection tools and provide new in silico assisted IPM approaches that will be validated and adapted to European socioeconomic and agricultural conditions. The FF-IPM response toolbox against emerging (C. capitata) and new (B. dorsalis, B. zonata) FF pest will be reinforced by a set of novel decision-support tools, dedicated and optimized to each of the target species. Pilot tests will be carried out in 8 different countries throughout the Mediterranean and Africa. Special attention will be paid to the generic merits of the developed approaches and methodology, to ensure their broader relevance and applicability to other invasive pest groups. This will be accomplished by a strong group of 21 partners from academia (8), research institutes and museums (5), businesses (5) and growers' organizations (3) from 15 countries (10 European, Israel, South Africa, China, Australia and the USA). The FF-IPM project is funded by the European Union under Horizon 2020 and coordinated by the Entomology and Agricultural Zoology Laboratory of the University of Thessaly, Greece.

Keywords: *Ceratitis capitata*, *Bactrocera dorsalis*, *Bactrocera zonata*, CLIMEX, Population dynamics.