Using a continuous microwave prototype for disinfestation of mill moth (*Ephestia kuehniella*) on unshelled almonds (*Prunus dulcis*)

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**Abstract.** The infestation of mill moth (Ephestia kuehniella) on almonds (Prunus dulcis) during the post-harvest and subsequent storage causes high product losses. The infestation is mainly due to the presence of insect eggs on shelled almonds; if larvae hatch after packaging and going on the nut, they would make the product no longer edible, with great economic and commercial damage.

In this study, a prototype of a microwave system for continuous disinfestation of unshelled almonds had been developed and used in industrial experimental tests to evaluate the pest control performance.

The machine is composed by a tube (length 3.14 m) with an inner spiral for the advancement of the shelled almonds and 5 magnetrons (each of 1.5 kW electrical power) located along the pipe. All safety devices have been implemented. Residence time and electrical power supplied setting has been manually regulated by PLC.

Operational parameters were investigated during preliminary tests phase to implement a research protocol for disinfestation tests. Eggs and larvae had been conditioned with different data input such as electrical power and residence time. Process condition determined guarantees significant disinfestation for larvae and eggs. The experiments showed the feasibility of the continuous microwave-system prototype as an alternative technique for almonds’ condition.