The MAGIC Project: a Tool for Promoting Safety in Agriculture during Covid-19 Pandemic

Pietro Catania1\*, Giuseppe Aiello2, Antonella Certa2, Santo Orlando1, Mariangela Vallone1

1University of Palermo, Department of Agricultural, Food and Forest Sciences, Viale delle Scienze, Ed. 4, 90128 Palermo, Italy

2University of Palermo, Department of Engineering, Viale Delle Scienze Ed. 9, 90128 Palermo, Italy

corresponding author \* – phone: +39 9123865608 - E-mail: [pietro.catania@unipa.it](mailto:pietro.catania@unipa.it)

[giuseppe.aiello03@unipa.it](mailto:giuseppe.aiello03@unipa.it); [antonella.certa@unipa.it](mailto:antonella.certa@unipa.it); [santo.orlando@unipa.it](mailto:santo.orlando@unipa.it); [mariangela.vallone@unipa.it](mailto:mariangela.vallone@unipa.it).

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**Abstract.** Covid-19 pandemic poses a threat to global health highlighting the importance of prevention and measures of social distancing. In agriculture, cultivation operations carried out in open field by farm workers represent a serious danger in this sense. Social distancing of the workers during the labor day is not always easy to be maintained, especially for the very close rows among the plants (both in open field and greenhouses). In 2020, the researchers of the Mechanics Section of the Department of Agricultural, Food and Forest Sciences in collaboration with the Department of Engineering of the University of Palermo, presented a project entitled “Design of a real time Monitoring and control system for AGrIcultural workers to limit the SARS-Cov-2 virus” (acronym MAGIC) to the Italian Ministry of University and Research, which was supported by the Fondo Integrativo Speciale per la Ricerca (FISR). The aim of the project was the design of a real time monitoring and control system for workers in agriculture in order to monitor record and control any violations of the distance between all the workers. The system includes georeferencing and remote real-time display of all contacts between employees. Respect for privacy was guaranteed through the application of a black box accessible only by the authorities responsible for control. The system provides for the use of a device wearable by the single operator and equipped with an autonomous battery for data recording. The system is based on the use of a token, i.e. a small device (wrist strap) equipped with a uniquely stored serial number that securely emits an alarm signal to both the worker and the manager when the distance between two employees is below the permitted threshold. A central manager perform a historical "track" that lists all the subjects with whom a person has come into close contact (and for how long). In the first phase of the project, the functionality of the system was verified in the laboratory, and then it was tested at a farm in Sicily during winter pruning in vineyard.