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### New technologies for the innovation of agro-food sector

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The technological support, in terms of new systems, materials and methods, at all times affected the development and the economic growth of any sector of the human activity. Agriculture, mainly in the last decades, has been supported and completely transformed thanks to the continuous technological innovations coming from Material Sciences, Engineering, Chemistry, Physics, Biology and, of course, from Agronomy. With the aim to confirm this thesis, in this presentation, it will be reported a few technologies, ready to be tested before the introduction in the agriculture world. In particular, we will present:

- **a new system for the improvement of solarization.** We studied a new approach based on the combination of a solarizing film and a biodegradable black liquid. The hybrid proposed system simulates a thermal solar panel and it behaves in the same way to increase the water temperatures in the soil. As a consequence, higher soil temperatures are reached with a satisfactory sterilization effect obtained in shorter times, in comparison with those obtained with the traditional method. This new method aims to eliminate the soil fumigation, based on the use of very aggressive chemical agents;
- **photoselective mulch plastic films for saving water.** Thanks to plastic mulch films, with special optical properties, such as high reflectivity in the visible and NIR range, it is possible to increase the water condensation under the film, affecting the water saving up to 30%;
- **use of special greenhouse covers with UV-B window.** UV-B radiation induces secondary plant metabolites that are potential benefits for plants and human health. According to recent studies, the use of plastic films, with a transmission of UV-B radiation, allows to increase the nutritional content in the crops, opening new scenarios for a more modern agriculture;
- **new generation of photovoltaic (PV) greenhouses.** Recently, ultra-thin semi-transparent a-Si PV panels have been proposed and they have attracted a great deal of interest. As it is well known, a-Si panels have an efficiency lower than poly- and mono crystalline silicon panels, but they have optical properties useful for potential application in agriculture as greenhouse covers; and, last but not least,
- **the contribute of applied thermography and IR imaging** for further developments of a future agriculture oriented to the quality of crops, not only to the quantity, and even more environment respectful.