

Tackling future food demand developing electrospun nanofibrous products for sustainable agriculture

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To tackle the escalating food demand consequent to the increasing world population, modifications to the typical intensive agro-productive system and mostly novel approaches have been introduced in agrosystems especially aiming at more sustainable agriculture in the last decades. The list of innovative approaches to achieve this goal is pretty long. It ranges from organic farming to conservation farming, agroecology, nature-inclusive agriculture, biodynamic farming, regenerative farming, high nature value farming, permaculture, carbon farming, climate-smart farming, circular farming, low external input farming, ecological intensification, and sustainable intensification. In addition, novel farming practices have also been developed to accomplish sustainability, like reducing or eliminating tillage, applying integrated pest management (IPM) and integrated nutrient management, planting cover crops and perennials, rotating crops, applying precision agriculture, integrating livestock and crops, and adopting agroforestry practices. More ground-breaking and technological solutions have been recently developed and include the use of nano(bio)sensors, nanostructured sensing systems, and bioactive nano(bio)products aimed at supporting productivity and reducing plant diseases, especially in horticultural croplands. Within this context, electrospinning has been recently suggested as a promising and versatile nanotechnology, despite at infancy, suitable to create a variety of products for agricultural applications. Here, we explore the most recent and advanced technological solutions, products and devices based on electrospinning, developed by scientists to support agriculture.