

Nanotechnology for plant pathogen control

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Abstract

Plant pathogens and pests are of the major factors limiting crop productivity. In crop sciences, nanotechnology can be used for the production of nanocapsules for delivery of pesticides, fertilizers, and other agrochemicals (Jha et al 2011). Nanotechnology for the control of plant diseases is a promising technique in plant pathology either by providing controlled delivery of functional molecules or as diagnostic tool for disease detection, an important step in plant disease treatment (Sharon et al 2010). Encapsulation of herbicides could provide improvement in their application. For example Sulfonylurea herbicides are applied through the soil to control *Orobancha* spp., but several applications are needed to achieve effective control (Joel et al 2007).

Several studies were conducted using Nanosized particles to control fungal pathogens including such as *Pythium multivium*, *Magnaporthe grisea*, *Colletotrichum gloeosporioides*, *Botrytis cinerea* and *Rhizoctonia solani*, as well as bacterial disease including *Bacillus subtilis*, *Azotobacter chroococcum*, *Rhizobium tropici*, *Pseudomonas syringae* and *Xanthomonas campestris* pv. *Vesicatoria* (Park et al 2006).

In Palestine, nanotechnology might be used for the control of several plant pathogens such as powdery mildews on grapevine and olive leaf spot on olive trees. We are interested in using nanosized silica particles and nanocapsules for the control of these diseases. In addition to that incorporation of nanoparticles for formulation and application of bacteria as biocontrol agents against soil borne pathogens will be tested.

References

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