

Application of Nanotechnology in Agriculture

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Abstract—Nanotechnology refers to controlling, building and restructuring materials and device on the scale of atoms and molecules. Nano is a greek word means dwarf. Nano materials using in agriculture for increase production rate such as nano sensor, nano fertilizer, nano pesticide etc. Gene therapy for plant use of 3 nm mesoporous silica nano particle for smuggling foreign DNA into cells. Seed technology use of carbon nano tubes increases the germination through better penetration of the moisture. In plant pathology 100% growth inhibition was seen in the *Pythium ultimum*, *Magnaporthe grisea*, *Collectotrihium gloeosporioides*, *Botrytis cinere* and *Rhizoctonia solani* showed at 10 ppm of the nano sized silica silver. In water treatment magnetite(iron oxide) nano crystals to capture and remove arsenic from contaminated water. Animal science nano micelles, liposome, nano emulsions complexes improves the utilization efficiency of nutrients in the fodder. Nano fertilizer technology foliar application of nano phosphorus as fertilizer (640mg/ha) and soil application of phosphorous fertilizer (80 kg/ha) yield equally in cluster bean and pearl millet under arid environment. In weed management soybean based nano surfactant reported to make glyphosate resistant crops susceptible to glyphosate. Nano pesticide use nano scale either active ingredients or inert ingredients with a particle size of 100 nm or less formulation of a pesticide as nano emulsion, nano suspension, nano encapsulation and nano particles. e-Nose operates like human nose and identify different types of odors and their concentrations. Application in sericulture 25 ppm of silver nano particles can be used as growth stimulant to increase the silk yield. Nano particles could be inhaled, swallowed, absorbed through skin. The trigger inflammation and weaken the immune system and interfere with regulatory mechanisms of enzymes and proteins. Nano particles could accumulate in soil, water and plants. National and international agencies are beginning to study the risk. The agriculture sector and the food industry will indeed see tremendous changes for the better in the coming years.

Keywords: Nanotechnology, nano fertilizer, nano pesticide.