

# NANO-FERTILIZERS

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### Strategic role of nanotechnology for fertilizers: potential and limitations

The ability of people to construct and manipulate materials at nano-scale has increased tremendously during the last decade building the fundamentals of the interdisciplinary science nanotechnology. Nanomaterials behave differently than the same material at non-nano scale; they have high surface area to volume ratio, high solubility, and specific targeting due to small size, high mobility, and low toxicity. They can be engineered for surface reactivity or other desired characteristics - unique behavior that can be both useful and profitable. As of March 2011, over 1300 commercially available products contain nanomaterials. Nanotechnology was a \$1 trillion industry in 2015.

According to the National Nanotechnology Initiative (NNI) (<https://www.nano.gov/about-nni>), “Nanotechnology research and development is directed towards understanding and creating improved materials, devices and systems that exploit nanoscale properties”. Following the definition of Royal Society, “Nanotechnologies are the design, characterization, production and application of structures, devices and systems by controlling shape and size at nanometer scale”.