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## Biosynthesis of nanoparticles and its application in agriculture

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Nanoparticles have better chemical reactivity, biological activity and catalytic behaviour which may be exploited for the benefit of mankind. Biosynthesized nanoparticles are more important in agricultural sciences due to their stability (>90 days) as they are naturally encapsulated by mother protein. Thirtynine organisms identified in our laboratory which have the potential to synthesize of N, P, K, Mg, Fe, Zn, Ti, Au, Ag and Pt nanoparticles. In general, agricultural important nanoparticles are applied to the foliar mode at two weeks old plant. Aerosol spray, lower concentration <5 ppm, particles of size <20 nm and cube-shape may help more penetration both in plants and microorganisms. Nanoparticles enter into plants through cuticle, stomata, stigma, root tips, cortex, lateral root junction and wounding. It may enhance prevention of membrane damage and stress tolerance. Improvement in root length, root area, chlorophyll content, enzyme activities, and protein content was also noticed. In general, three times efficiency of nano-nutrient was observed after using biological nanoparticles. Nano-induced polysaccharide powder helps more moisture retention, C and microbial build up in arid and semi-arid areas. In general 15-50% improvement in crop yield, 8-100 times improvement in nutrient use efficiency was noticed with the application of biosynthesized nanoparticles to different crops. The early maturity was also noticed in vegetable due to nanoparticle application. Thus, nanotechnology can be an important part of the future agriculture and food industry.

#### Biography

J. C. Tarafdar did his M.Sc. & Ph.D. from Indian Agricultural Research Institute, New Delhi and Post Doctoral Research in Göttingen University, Germany. He is a DAAD, AvH, NAAS, ISSS, ISSRS and National Fellow. He has published 286 research articles in reputed journals including 2 books and 28 book chapters. He has four patents and 39 potential organisms for nanoparticle production. He has received many awards most notable are Sukumar Basu Memorial Award, IMPHOS-FAI Award, Bharat Jyoti Award, Prof. S. K. Mukherjee Memorial Award, Prof. R. S. Murthy Memorial Award and Glory of India Gold Medal.

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## Maximisation of seed yield in sunflower using micronutrients

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**S** eed production in field crops is a continuous process. In seed production plots of sunflower, the deficiency of boron and sulphur is very much pronounced every year. It is also a regular feature in farmer's fields. But, the extent of the micro nutrient deficiencies on the seed quality is not estimated. Therefore, to study the effect of deficient micro nutrients of the location on quality seed, the present study was taken up during rabi 2011-12 at Seed Research & Technology Centre, Rajendranagar, Hyderabad using sunflower hybrid, APSH 66. The experiment was laid out in a randomized block design and replicated wise. Nine treatments viz., soil application of sulphur @ 10 kg /ha, 20 kg /ha and 30 kg/ha, soil application of borax @ 0.5 kg /ha, @ 1.0 kg/ha and 1.5 kg/ha, dusting of boron @ 2 kg /ha on flower heads, directed spray of boron on flower head @ 0.2% were imposed besides maintaining a control plot. The results revealed significant differences were noticed among the treatments for all the characters under study. Of all the treatments studied, soil application of sulphur @ 10 kg/ha recorded maximum yield of 22.93 q ha<sup>-1</sup> followed by soil application of borax @ 1.0 kg/ha (21.85 q ha<sup>-1</sup>) and were found to be significantly superior to control (20.04 q ha<sup>-1</sup>). Besides seed yield, good quality seed is one of the pre requisites for breeder/foundation seed productions. Soil application of sulphur @ 10 kg/ha recorded good germination (100%), root length (16.9 cm), seedling length (29.2 cm) and seedling vigour index I (2913) as against control (99.8, 14.8 cm, 27.1 cm and 2707, respectively). Therefore soil application of sulphur @ 10 kg/ha can be recommended to the farmers to realize higher productivity besides superior seed quality in sunflower.

### Biography

K. Kanaka Durga is presently working as Senior Scientist (PI. Br.), Seed Research and Technology Center, ANGR Agricultural University, Hyderabad. She joined as Scientist (PI. Br.) in AICRP on Pulses at RARS, Lam during 1998 after completion of doctoral studies in the same University. Her work initially involved in development of pulse varieties (5) at RARS, Lam Suitable for Andhra Pradesh. Presently, she is involved in Seed Research of different crops particulary development of DUS testing guidelines in horsegram and developed seed testing strategies in various crops. Also she is actively involved in guiding P.G. students and so far she has guided three students. And she has 22 research publications as on date.

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