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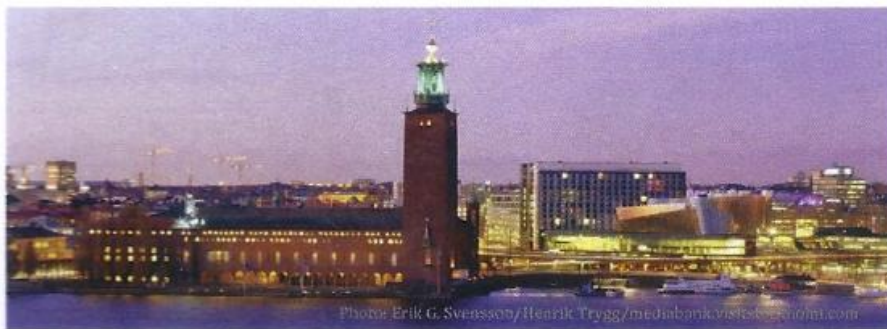


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Ortho Silicic Acid (OSA) based formulations facilitates improvement in plant growth and development

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Plants take up silicon equivalent to some macronutrients, in spite of this it is not widely recognized as an essential element. Perusal of literature ensures a pivotal role of Silicon in improving growth and development in various crops. The lower acceptance of essentiality of Silicon for plant could be due to lack of systemic studies. *Ortho Silicic Acid (OSA)*, the only bioavailable form of Silicon is a highly unstable molecule. Limited studies aimed to decipher the importance of silicon in agriculture employ adequate sources of Silicon. *Privi Life Sciences Pvt. Ltd.*, have developed and further improved unique proprietary formulas through a patented technology. The technology is being employed for the development of both liquid and (solid) powder formulas. The brand name of the product is *Silixol*. Availability of OSA facilitated us to dissect out pathways to understand the mode of action of this chemical compound within plants. We are involved in undertaking extensive studies to understand the role of OSA in various aspects of plant growth. In the present paper we would like to discuss studies aimed to enhance seed vigour and ultimately plant stand in various groups.

Studies were undertaken to exploit the role of OSA in improving seed vigour. Experiments were designed using different concentrations (1%, 2% or 4%) of powdered *Silixol* along with a seed coating polymer on maize seeds. Silicon coated seeds, when germinated, exhibited good seedling vigour coupled with 20% increment in seedling length and 27% increase in the biomass. Where coating is not preferred, seeds were soaked in a liquid *Silixol* solution prior to sowing. The application of *Silixol* had attributed to better seedling vigour along with 27% increase shoot length of seedling and 37% increase in the fresh weight over control seeds. To have a better insight of this response, rate of imbibition, mobilization efficiency of reserve material as well as starch-sugar content of the germinating seeds were analyzed.

It was found that the presence of OSA increased the rate of imbibition, which in turn triggers better mobilization of reserve material (39.7% in treated seeds against 24.1% in control, after 2 days). Therefore, it plays an important role in nutrient partitioning as well mobilization. Foliar spray of *Silixol* had led to better nutrient uptake in the rice, when applied at the nursery stage. This facilitates early transplanting. Seedling had exhibited almost three fold increase in the length. The sprayed seedling also had a better nutrient status with regards to various nutrient ions especially P and K. Seedlings sprayed with *Silixol* showed a 17% increase in Chlorophyll content over control, ultimately contributing towards a higher rate of photosynthesis. To further enhance our understanding about essentiality of Silicon in crop improvement, we are on the way to dissect its role at the biochemical as well as molecular levels.