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Role of Orthosilicic Acid (OSA) Based Formulation in Improving Plant Growth and Development

Silicon
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Abstract

Studies were aimed to understand the role of orthosilicic acid (OSA) in improving seedling development. Different concentrations (0.1 % or 0. 2 % v/v) of Silixol (a proprietary formulation with stabilized orthosilicic acid 0.8 %) were used. Seeds were treated with Silixol in two ways: wet coating and overnight soaking. Seeds wet coated with Silixol exhibited good seedling vigour coupled with increased seedling length and biomass. Seeds soaked overnight in a liquid Silixol (diluted at 0.1 % or 0.2 %) solution exhibited a similar response in terms of seedling vigour and biomass. The application of Silixol is attributed to better seedling vigour along with 25 % increase in seedling length and 64 % increase in the fresh weight over control seeds.

A foliar spray of Silixol enhanced uptake of essential nutrient (viz. P, Ca and K), when applied in the nursery. Seedlings sprayed with Silixol had higher levels of chlorophyll content over the control, accounting for a higher rate of photosynthesis.

A threefold increase in the seedling length was recorded in the sprayed plants compared to the unsprayed.

In main fields, foliar sprays at three critical stages of rice (active tillering 25 DAT, panicle initiation 40 DAT and heading 60 DAT), resulted in better seedling development. Various growth parameters viz., root volume, number of tillers along with various yield attributing traits were recorded better in sprayed plants compared to the control. An improvement in quality of grains was also recorded in terms of uniformity in size as well as shininess. Husks of grains harvested from sprayed plants had lower infestation by the pests and pathogens. Three foliar applications of Silixol culminated in an average yield increment of ~15 %, irrespective of variety. In addition to this the incidence of white earheads was reduced in a sprayed plot (4.3/sq m) compared to a control plot (10.3/sq m).

Keywords

Silicon Crop improvement Yield Quality

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