

Effect of Zinc and Silicon on Growth and Yield of Aromatic Rice (*Oryza Sativa* L.) in North-Western Plain Zone of India

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Abstract

The present study entitled impact of Effect Zinc & silicon levels on rice in the north plain zone of India was carried out at the School of Agricultural Sciences and Engineering, IFTM University Moradabad 2018-19. The effect of zinc is mainly in rice. Zinc deficiency is a major constraint to reduce the potential yield of rice. Field experiments were carried out to find out the effect of three different levels of zinc on rice. The effect silicon is the second most abundant element and diseases resistance, grain quality improve in the earth's crust after oxygen and accounts for about 28% of the soil weight, but is not considered essential for the growth of higher plants develops necrosis, disturbance in leaf photosynthesis efficiently growth retardation and reduces grain yield in cereals role of zinc & silicon in plant health and growth has been investigated in silicon accumulating crops and it seemed significantly effecting with treatment T1 control T2 (120:80:40) T3 (120:80:40) + two sprays of zinc 0.5%/lit water (at 30 & 45 DAT), T4 (120:80:40) two spray of silicon @ 2ml/lit water (at 30 & 45 DAT), T5(120:80:40)+two spray of silicon @3ml/lit water T6(150:80:40), T7(150:80:40)+two spray of zinc 0.5%/lit water (at 30& 45DAT), T8(150:80:40)+two spray of silicon @2ml/lit water (at 30&45 DAT), T9 (150:80:40)+ two sprays of silicon @3ml/lit water (at 30 & 45). Silicon (Si) is the second most abundant element in the earth's crust and considered as a beneficial element for crop growth, especially for crops under poaceae family.

Rice is a typical silicon accumulating plant and it benefits from silicon nutrition. Its supply is essential for healthy growth and economic yield of the rice crop. Silicon interacts favorably with other applied nutrients and improves their agronomic performance and efficiency in terms of yield response. Also, it improves the tolerance of rice plants to abiotic and biotic stresses. Hence, silicon management is essential for increasing and sustaining rice productivity. Accumulation of Si in leaves and tissues in addition to conferring resistance against fungal diseases and insect pests, can improve erectness of leaves, increase yield and alleviate water stress, salinity stress and nutrient deficiency or toxicity stresses as well. Silicon is also considered as an environmentally-friendly element in relation to soils, fertilizers and plant nutrition. In modern agriculture, Si has already been recognized as a functional nutrient for a number of crops, particularly rice and sugarcane, and plays an important role in the growth and development of crops, especially gramineae crops. The hulls of poor-quality and milky-white grains (kernels) are generally low in silicon content, which is directly proportional to the silicon concentration in the rice straw. On the basis of experimental findings, it can be concluded that NPK150:80:40 + Two Zn spray @0.5% at 30 and 45 DAT proved to be better when the yield attributes had improved significantly with increasing fertility level from control to NPK 150:80:40 + Two Zn spray 0.5% resulting in higher grain yield of Rice.

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