

Study on the Changes in Root Parameters of Rice Varieties under Varying Zn Sensitivity

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Abstract—A pot experiment was conducted in the green house to study changes in root parameters of different varieties of rice under Zn-deficient and sufficient conditions. The different varieties of rice (PD 6, PD16, NDR 359 and PS 5), varying in Zn sensitivity were tested under two levels of Zn i.e 10 mg Zn/Kg soil as ZnSO₄.7H₂O and 0 mg Zn/Kg soil. The growth stages for study were D₁ (30 days after transplanting), D₂ (60 days after transplanting), D₃ (90 days after transplanting), and D₄ (120 days after transplanting).

At D₃, Zn decreased root length by 30.5 percent in PD 16 while in NDR 359 increase of 32.3 percent was observed in root length. At D₃, a decrease of 5.4 and 12.8 percent in the surface area of root was noticed in PD 16 and PS 5. However; the differences observed in other two varieties were not significant. Application of 10 mg Zn kg⁻¹ soil had no effect on root volume of all four rice varieties. At D₃ with zinc application root volume decreased by 38.5 and 21.4 percent in PD 16 and PS 5. With Zn application the number of root tips increased by 6.0 percent in NDR 359 while a decrease of 31.3 percent was in PD 6 at D₃. At D₂, Zn application decreased the number of forks by 36.8 percent in PS 5.

The results showed that NDR 359 exhibited significant increase in root length, root tips and number of forks to increase the effective area of nutrient absorption in soil under Zn deficient conditions whereas, the cultivars PD 16 and PS 5 showed no significant increase in root parameters under Zn deficiency.

Keywords: Zn Sensitivity, Deficient, Sufficient, Root parameters.