

Effects of Salinity on the Growth and Yield of Selected Rice (*Oryza saliva*) Cultivars at Different Growth Stages

S. Puvanitha, S. Mahendran, N. Sujirtha

Department of Agricultural Biology, Faculty of Agriculture, Eastern University, Sri Lanka.

Salinity is a limiting environmental factor for plant production and is becoming more prevalent as the intensity of agriculture increases. Limited water and hot dry climates frequently increases the salinity levels that limit crop production in arid and semi-arid regions. It is estimated that 2% of the rain-fed agricultural area is affected by salinity globally. In agriculture, a soil having a salt concentration exceeding an electrical conductivity value of 4 dSm^{-1} is classified as saline. This experiment was conducted to assess the effects of salinity on the growth and yield of selected rice cultivars. The growth of three rice cultivars namely; "Pachaiperumal", "At 307" and "At 308" were evaluated under saline (6.52 dSm^{-1}) and non-saline (1.76 dSm^{-1}) conditions. This experiment was laid out in the Completely Randomized Design with two factors in a factorial arrangement. There were six treatments and each one was replicated four times. Root and shoot dry weights and yield of the tested rice cultivars were significantly reduced by salinity. Rice cultivar "At 307" showed the highest root dry weights at all three growth stages, vegetative, reproductive and ripening (0.21, 10.1 and 26.4 g) respectively when exposed to salinity and the lowest root dry weights (0.03, 5.7 and 19.0 g) were found in "Pachaiperumal". The % reduction in root dry weights of "At 307" and "Pachaiperumal" were 19.2, 66.7; 30.3, 51.7 and 36.2, 46.3 during the vegetative, reproductive and ripening stages respectively. Cultivar "At 307" showed the highest shoot dry weights when exposed to salinity during all the three growth stages and the lowest weights were found in "Pachaiperumal". The % reduction in shoot dry weights of "At 307" and "Pachaiperumal" were 25.7, 55.6; 36.7, 52.4 and 29.6, 62.7 during the vegetative, reproductive and ripening stages respectively. Salinity significantly reduced the yield of all the tested rice cultivars. The highest (2.0 t ha^{-1}) and the lowest yields (0.44 t ha^{-1}) were recorded by "At 307" and "Pachaiperumal" respectively. Hence, "At 307" was identified as the most salt tolerant rice cultivar among the three rice cultivars tested which could be grown in the saline tracts of Batticaloa district.

Keywords: Growth attributes, Rice cultivars, Salt tolerant, Yield