

The effects of the temperature regimes 12°C, 20°C, 28°C on some aspects of three rice varieties shingo ya Mjikazi, Matama and Sindano were investigated. Rice seedling grown in Biotrons and raised in sand cultures (acid washed sand irrigated with culture solution) and on nutrient solution culture were used in the study. The aspects investigated included imbibition, germination, height, fresh weights, dry weights, nitrogen and phosphorus contents, and nitrogen and phosphorus uptake, chlorophyll and transpiration rates.

The rate of imbibition and percentage germination increased as temperatures increased from 12°C to 28°C. Varietal difference in imbibition was insignificant but significant in germination. Parameters of plant growth (heights, fresh weights, dry weights, and relative growth rates) increasing with increasing temperature. The varietal differences were found to be significant with respect to the height and shoot fresh weight. Nitrogen and phosphorus contents together with nutrient (P and N) uptake increase with increasing temperatures. Varietal difference in the nutrient aspects were significant except in the amount of phosphorus in the roots and uptake. Chlorophyll content was very low at 12°C but was higher at 20°C and 28°C. However the varietal differences were insignificant. A similar observation was made in the rate of transpiration.

It is concluded that temperature has significant effects on the performance of rice. Rice seedlings could not survive at 12°C, which therefore means that it is possible to grow the varieties under study at areas with temperatures of 20°C. It is also recommended that performance of upland rice varieties in the field could be carried out with a narrower temperature range between 12°C and 20°C to determine the lower limit of temperature for the growth of rice. More varieties could be studied so as to identify those that may perform well under lower temperatures.