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Growth of Broadcasted Rice and Compensatory Effect on Yield at Different Seedling Densities

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Abstract:

A field trial was conducted to analyze the growth characteristics and compensatory effect on the yield of rice(cv.Yamahikari)broadcasted in submerged soil at four levels of seedling density(32, 64, 96, 160/m^2).The relative tillering rate(RTR)and relative growth rate(RGR)were greater in higher density plots(96, 160/m^2)in the early growth stage and greater at lower seedling densities in the subsequent growth stage.The difference in RGR was mainly attributed to leaf area ratio (LAR)in the early growth stage and net assimilation rate(NAR)in the subsequent stage.A difference in specific leaf area was observed during the growth period, which was responsible for the differences in LAR and NAR at 58-79 days after sowing (DAS).Although there were distinctive differences in yield components, the changing patterns of which to seedling density were not similar.There was no significant difference in yield per m^2 among seedling densities.The lower density plots(32, 64/m^2) showed high RTR through high NAR in the middle and late growth stages, and the panicle number per plant was greater at lower seedling densities.This was the first respanse for compensatory effect.The spikelet number per panicle increased when ponicle number per m^2 decreased with the decrease in seedling density, which was also an important factor on the compensatory effect.Here, a positive correlation was found between spikelet number per panicle and NAR, and RGR at 58-79DAS.

Keywords:

Broadcast seeding, Compensatory effect, Growth analysis, Leaf morphology, Rice, Seedling density, Yield

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