Effects of seeding density and organo-mineral fertilization on growth and yield of a new rice variety (ISRIZ 7) in Lower Casamance (South West, Senegal

Baboucar Bamba [1a*]; Boubacar Camara [2]; Rahim Mballo [1b]; Portunais Diedhiou [3]; Mame Fatoumata Goudiaby [1c]

1[a] Senegalese Institute of Agricultural Research/Agricultural Research Center; of Ziguinchor, Cap-Skirring road BP 34, Ziguinchor, Senegal; ID ORCID: 0009-0004-8678-069X

1[b] Senegalese Institute of Agricultural Research/Saint Louis Agricultural Research Center; Senegal/ Weed service. BP 240

1[c] Senegalese Institute of Agricultural Research/Saint Louis Agricultural Research Center/Entomology service. BP 240

2 Department of agroforestry, Laboratory of Agroforestry and Ecology, UFR Sciences and Technologies, Assane Seck University of Ziguinchor, BP: 523, Ziguinchor, Senegal.

3 Plant Production and Agronomy Section, UFR of Agricultural Sciences, Aquaculture and Technologies Food, Gaston Berger University of Saint Louis, BP 234 Saint Louis.

*** Corresponding author :** Baboucar BAMBA, Email : beubeuz04@yahoo.fr; bambaboubabcar@gmail.com

Keywords: seeding density, fertilization, rice, yield, Casamance

Submitted 05/11/2025, Published online on 31st March 2026 in the *Journal of Animal and Plant Sciences (J. Anim. Plant Sci.) ISSN 2071 – 7024*

1 ABSTRACT

Rice is one of the most important staple cereals cultivated and consumed in Senegal, Rice cultivation is the primary activity for small-scale farmers in Casamance (South West, Senegal). This study, conducted at the new rice growing station in Agriculture Research Center of Djibélor during the 2023 rainy season, aimed to assess the effects of different sowing densities and organo-mineral fertilization on the growth and yield of the lowland rice variety ISRIZ 7. The goal was to identify the optimal combination of seeding density and fertilization for maximum production. A split-plot design with four replicates was used, with fertilization as the main factor and seeding density as the secondary factor. Four fertilization treatments were tested: (T) control (no fertilization or no amendment), (FM1) 200 kg/ha NPK (15-15-15) + 150kg/ha urea (46%N), (FM2) 5tons/ha compost + 200kg/ha NPK (15-15-15) + 150kg/ha urea, and (FM3) 5tons/ha compost. Seeding densities were: (DeS1) 98plants/m², (DeS2) 61plants/m², and (DeS3) 41plants/m². Results showed that the highest plant heights occurred with low-density sowing (68.8 ± 6.1cm) and fertilization (72.2 ± 5.3cm for organo-mineral and 66.4 ± 4.7cm for mineral fertilization). Insect damage was greater in high-density plots with mineral fertilization. Tillering and panicle production increased with mineral (14.6 ± 3.8tillers/plant; 425 ± 116 tillers/m²) and organo-mineral fertilization (351 ± 99panicles/m²). The highest grain and straw yields were recorded at low seeding density (5437 ± 3359kg/ha and 6197 ± 3566kg/ha, respectively) and with mineral fertilization (4388 ± 2711kg/ha and 4930 ± 2837kg/ha). However, collar diameter, fertility rate, 1000-kernel weight, and harvest index were unaffected by either seeding density or fertilization.