

In vitro Plant regeneration of “Hassawi” rice and selection of drought-tolerant biotypes through somaclonal variation

Abdulaziz M. Al-Bahrany
College: Agricultural and Food Sciences
Department: Horticulture

Jameel M. Al-Khayri
College: Agricultural and Food Sciences
Department: Date Palm Research Center

Abstract

Hassawi rice (*Oryza sativa* L.) is a land race cultivar adapted to eastern Saudi Arabia. A system for in vitro callus induction and plant regeneration was established. The system consisted of two consecutive phases, callus induction and plant regeneration. Callus was established from mature caryopses cultured on MS medium containing 2,4-dichlorophenoxyacetic acid (2,4-D) at 0.75, 1, 1.25, 1.5, 2, or 2.5 mg L⁻¹ and 6-furfurylaminopurine (kinetin) at 0, 0.5, 1, or 2 mg L⁻¹. Out of the explants, 30% to 80% formed callus depending upon hormonal combination, the remainder either germinated forming whole plants or produced roots only. Highest callus induction percentage occurred on 2.5 mg L⁻¹ 2,4-D alone; however, greatest callus weight was obtained on 1.5 mg L⁻¹ 2,4-D combined with 2 mg L⁻¹ kinetin. To encourage regeneration, callus was transferred to hormone-free MS medium. Plant regeneration was best achieved, over 90%, from callus induced on 1 mg L⁻¹ 2,4-D with 0 or 0.5 mg L⁻¹ kinetin, albeit these treatments were associated with relatively low callus frequency and small callus weight. Plantlets survived in soil and exhibited normal phenotype.

Sorbitol abstract