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Research article

Agronomic Performance and Genetic Fidelity of the Selected Elite Cocoa Clones Derived from Somatic Embryogenesis Culture

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Abstract

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This study was conducted to compare the agronomic performance of four elite cocoa clones (MCBC1, KKM22, KKM4 and PBC230) regenerated from staminode and immature zygotic embryo culture with conventional grafted cocoa clones. From the results, it was found that the KKM4 clone propagated from immature zygotic embryo culture exhibited variations in the fresh pod weight (339.6 g), fresh individual seed weight (4.13 g) and number of flat beans per pod (4 beans) compared with the rest of the regenerated clones. The genetic stability of the somatic embryogenesis cultured clones and the donor clones was then tested using fragment analysis with five SSR primers, i.e. mTcCIR7, mTcCIR18, mTcCIR22, mTcCIR33 and mTcCIR40. Four of these primers identified variations in the allele size and allele addition in KKM4 clone from immature zygotic embryo. Molecular analysis validated that the difference in agronomic performance of the KKM4 clone from immature zygotic embryo culture was due to genetic mutation created during the immature zygotic embryo culture process.

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