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Analysis of genetically modified BT and cp4EPSPS cotton cultivars for transformation efficiency, acclimatization, expression and toxic levels to insects

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The major application of Biotechnology is the transfer of desirable characteristic in the host. To attain resistance against insects and weeds, this application was employed to transfer a double Bt and a glyphosate gene into two cotton varieties, FH-114 and CIM-598. Three genes Cry1Ac, Cry2A and Glyphosate gene were transferred through the Agrobacterium method using a plant expression vector with genes under the control of the CaMV35S promoter and NOS terminator sequence. Confirmation of insertion and expression of these genes in cotton plants was done through PCR and ELISA. Transformation efficiency for FH-114 and

CIM-598 was 1.2% and 0.8% for Cry1Ac, 0.9% and 0.6% for Cry2A and 1.5 and 0.7% for GTG respectively. FH-114 plants acclimatized better than CIM-598 plants when exposed to sunlight. Cry1Ac, Cry2A and GTG proteins were 1.2, 1 and 1.3 ng μ l⁻¹ for FH-114 which was more than CIM-598 for all three genes. FH-114 plants were able to control better insects and weed damage when subjected to a cotton leaf bioassay. Taken together, FH-114 genetic profile was more suitable for genetic modification to control insects and weed when compared to CIM-598.

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