GENETICALLY MODIFIED (GM) RUBBER INTEGRATED WITH *Hb*MnSOD GENE FOR ABIOTIC STRESS TOLERANCE - WAY TO CONFINED FIELD TRIAL

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Evolving climate-resilient and high-yielding clones of Para rubber tree (*Hevea brasiliensis*) is one of the top priorities in natural rubber research. In view of the above, transgenic plants of clone RRII 105 integrated with *Hb*MnSOD gene for imparting abiotic stress tolerance, were developed *via Agrobacterium*-mediated genetic transformation. The transgenic plants possessed better drought tolerant traits as evidenced from various physiological and molecular studies conducted in the contained facility. In continuation, a small scale confined field trial of the transgenic plants was initiated at the Regional Research Station, Guwahati, Assam following the biosafety regulations. The transgenic plants are being assessed for their ability to withstand cold stress, disease incidence and latex yield. The commercial release of transgenic plants can be carried out only after assessment of the performance in the confined field trial.

Keywords: *Agrobacterium tumefaciens*, Confined field trial, Genetic transformation, Transgenic plants

Hevea brasiliensis is a perennial tree commercially exploited for the production of natural rubber (NR) and it contributes to 95 per cent of the world NR production. NR produced in the laticifers of the rubber tree is a high molecular weight biopolymer with unique technical properties making it a vital strategic raw material with many medical and industrial applications. Conventional breeding in *Hevea* is laborious and time consuming, as evaluation and selection takes about 25 years to evolve a new hybrid clone. However, biotechnological interventions can ensure rapid incorporation of target genes linked to specific agronomic traits like enhanced stress tolerance in the genetically modified (GM) plant. This makes GM approach highly preferable for genetic improvement of *Hevea*. Limitations in land availability in the traditional belt combined with the rising demand for NR (due to mismatch in the demand and supply chain), have forced extension of the crop to marginal zones. Marginal areas are prone to abiotic constraints like drought and cold stress, high light etc. Exposure of the plant to these stressful environments results in the formation of superoxide radicals and

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