Breeding and Simple-rapid Regeneration Protocol for Jisheng 1 with Glandless Trait and High-frequency Somatic Embryo Production Ability

LI Wei-ming[1], ZHANG Han-shuang[1], ZHAO Jun-li[1], SUN Jing-yan[2]

(1. *Cotton Research Institute of Haafs, Shijiazhuang, Hebei Province* 050051, *China*; 2. *Hebei Normal University Shijiazhuang, Hebei Province* 071001, *China*)

Most of model cotton varieties used in tissue culture have glands on both the reproductive and vegetative parts of the plant. These glands contain compounds that are toxic to human and non-ruminant animals. The presence of these compounds limits their usage as food and feed. To obtain a glandless cotton variety with high-frequency somatic embryo production ability, 27 glandless varieties were screened in improved MSB media containing 0.1 mg • L^{-1} IAA, 0.1 mg • L^{-1}KT, and 0.1 mg • L^{-1} 2, 4-D. Hengwu 8930, whose regeneration rate was only 2.5%, and the cycle of regeneration was about 12 months had the highest frequency. After 8 generations of systematic breeding (alternating regeneration and plantation), its regeneration rate increased to 19.6%, but the cycle of regeneration had no obvious change. A simple-rapid regeneration protocol, in which the regeneration rate was 68% and the cycle of regeneration was about 6 months, was established by hormone regulation. Explants of hypocotyl sections were cultured in improved MSB media containing 0.5 mg • L^{-1} IBA and 0.25 mg • L^{-1} KT, and they produced large quantities of callus that was easier to regenerate. Calli, which were subcultured in the same media for 2-3 times (each time 1 month), produced embryoid callus at a rate of 68%, and the embryoid callus subcultured in the same media for 2-3 times (each time 1 month) produced plantlets at a rate of 98%.