The present study investigated the effects of genotypes, of pre-treatment (cold-treatment within one week at 4°C and non-cold treatment) and carbohydrate sources (maltose at 120 g/L and sucrose at 90 g/L) on anther response ratio, callus induction and plant regeneration alike. In our experiment, the modified N6 medium consisting of 5 g/L of agar, 2 mg/L of 2,4-D, 0.5 mg/L of KIN (kinetine) and of 1 mg/L of IAA (indole-3-acetic acid) were used for callus formation. It was done using factorial trial design with 20 repetitions on randomised plots.

First the anthers were placed in Petri dishes and kept at 27°C for four weeks, then they were incubated at 22-25°C in 16 h/8 h day/night photoperiod for 14 weeks. After that, the embryonic calli were transferred to development medium, and the subcultures were kept at 22-25°C in 16 h/8 h day/night photoperiod for four months. Our study demonstrated the significant influence of pre-treatment and carbon sources on anther response ratio (%), on ratio (%) of anthers forming calli and on calli sizes, but it also showed that the influence of genotype was not significant. The highest plant regeneration ratio (%) was obtained as a result of pre-chilling and maltose treatments of diploid ryes.