

Dagustu N, Sincik M, Bayram G, Bayraktaroglu M (2010) Regeneration of fertile plants from sunflower (*Helianthus annuus* L.) – Immature embryo. Helia 33(52):95-102.

Abstract

Immature embryos from 15 sunflower genotypes (five restorers, five cytoplasmic male steriles, and five maintainers) were studied with the aim to shorten the seed to seed cycle, because seed maturation in sunflower takes 50-60% of the life cycle duration (120-150 days). This technique allows the production of fertile plants from immature embryos by reducing the breeding cycle. Ten days after pollination immature embryos were dissected from seeds grown in field plants (SGFP) and were transferred to MS medium allowing shoot and root development for 5-10 days. Young plantlets were transferred to soil, developed to maturity, and were then self pollinated and set seed. The first cycle of immature embryo-raised plants (ERP) was obtained. When these plants were at the flowering stage, 10-day-old embryos were dissected and the 2nd cycle of ERP was obtained. The plants at the flowering stage for obtaining the 3rd cycle are in the growth chamber at the moment. The majority of cultured embryos developed into vigorous plantlets with 3-6 leaves. Out of the 1710 immature embryos, the average response of the explants was 93.1% (1591) showing morphogenesis with a minimum of 42.5 [N Record 109/Sanay 1-2(N)] and a maximum of 100% [(PR6404 (*cms*), Narmo Sanay 6-1 (*cms*), RIM 1-5 (*cms*), BGC0565 (N), N Record 109/Iscra (N), RHA 04, RHA 06, RHA 10, RHA 14, RHA 15]. Seventy percent of the developed plantlets had vigorous roots. They were transplanted into containers with a 1:1:2 peat: perlite: soil mixture (v/v) at $24 \pm 2^\circ\text{C}$ in 16 h/8 h (light/dark) in a growth chamber. Only 67.3% of them were grown to maturity, either self-pollinated or pollinated with maintainers and set seeds. The overall result was an average of 40-50 regenerated and matured plants per 100 immature zygotic embryos.