

Polymerized Peat Plugs as an Alternative to Gelled Medium for American Chestnut Somatic Seedling Production

M.L. Maner¹ and S.A. Merkle¹

One significant bottleneck remaining in the process of mass propagation of American chestnut via somatic embryogenesis is the conversion of somatic embryos to somatic seedlings that continue vigorous growth following transfer to potting mix in the greenhouse. Currently, chestnut somatic embryos are germinated on semisolid germination medium (GM) and grown *in vitro* for several weeks prior to potting in peat-based potting mix and acclimatization to greenhouse conditions. Upon removal from gelled medium, root systems of chestnut somatic seedlings are usually small and lack branching. As an alternative to germination on semisolid medium, we tested the use of polymerized peat plugs and liquid GM for germination and conversion of chestnut somatic embryos. Following a 15-week cold pre-germination treatment, over 200 embryos representing four culture lines were transferred to GA7 vessels containing semisolid GM and incubated for three weeks. Then, half of the embryos of each line were transferred to autoclaved polymerized peat plugs saturated with liquid GM in sterilized GA7 vessels. The other half of the embryos remained on semisolid GM in GA7 vessels. Embryos in plugs were fed with 5 ml of liquid GM every 2-3 weeks. While conversion rates were low for all of the embryos and results varied with clone, overall a higher frequency of somatic seedlings were produced using the polymerized peat plugs rather than semisolid medium. Furthermore, root systems of somatic seedlings in plugs were larger, with more lateral roots than in gelled medium. Somatic seedlings in plugs removed from *in vitro* conditions and rinsed free of GM were successfully acclimatized in a hardening-off chamber. Following transfer to potting mix, they continued growth in the greenhouse.

¹ Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA 30602