Establishment of an Efficient Mass-Scale Propagation Protocol for three different Apple Rootstocks Cultivars - *Malus prunifolia*, *Malus sylvestris* and M9.

Bal Kumari Oliya[1,2]*, Sudha Acharya[1], Shova Sharma[1] and Bijula Neupane[1]

[1]*Warm Temperate Horticulture Centre, Kirtipur, Kathmandu, Nepal*

[2]*Seed Quality Control Centre, Hariharbhawan, Lalitpur, Nepal*

*Corresponding author's email: balkumarioliya1@gmail.com

Abstract

The demand for quality saplings (the grafted plants) in many horticultural crops increasing day by day. In this research we have established an in vitro propagation protocol in three different apple cultivars used for rootstock production- Malus prunifolia, Malus sylvestris and M9. The single node of each species that was was taken from a one-year-old in vivo grown plant was inoculated in Full strength (FMS) and half strength (HMS) of Murashige and Skoog (FMS) basic media supplemented by 3% sucrose and 0.8% Agar. For shoot multiplication, FMS and HMS, combined with (0.5, 1.0, 1.5 and 2) mg/L benzyl amino purine (BAP) alone or in a combination of 0.1 and 0.2 mg/L of α-naphthaleneacetic acid (NAA), Indole Acetic acid (IAA) and Indole Butyric Acid (IBA) were used. Among them, FMS combined with 0.5 mg/L of BAP responded best for induction of a higher number of shoots 11.5, 6.5 and 5.5 with shoot lengths of 5.5, 3.5 and 3.2 cm, respectively for M. prunifolia, M9 and M sylyestris. Further, FMS combined with 3 mg/L of IAA performed best for in vitro rooting for M prunifolia where, 4 roots with 3.5 cm of root length were induced and 1 mg/L IBA showed the best rooting response for M. sylvestris where 3.5 roots with 2.5 cm of root length were obtained. In primary hardening, 45 percent of M prunifolia and 30 percentage of M sylvestris in vitro rooted plants were successfully acclimatized on a 2:1:1/2 ratio of soil: sand: cocopeat.

Keywords: tissue culture, apple, high-density planting, acclimatization, rootstock production