Effects of Culture Medium and Magnetic Field in Propagation and Anatomic Characters of Peach Rootstock *Prunus persica* L.Batsch CV. Local Baydawi by Tissue Culture

Ayad Assi Obaid

Abstract

This study was conducted at the laboratory of Plant Tissue and Cell Culture, Department of Horticulture and Landscape Design, College of Agriculture and Forestry , Mosul University. The objective of this study was to show the effects of growth regulators, media content , photoperiod , north and south pole of magnetic field and electromagnetic field, in order to propagate peach rootstock *Prunus persica*L.Batsch Cv. Local Baydawi by using tissue culture techniques. The data can be summarized as follow:

Apical tips and nodes cuttings sterilized with NaOCl and cultured in MS medium supplemented with BA or 2iP (0 ، 1 ، 2 ، 4 and 5 mg/ l), after 4 weeks, the best response appeared when the node were cultured with 2 mg/l BA, which gave (2.6) buds/single node whereas the best result (1.6) buds when apical tips cultured with 3 mg/l BA.

Cytokinin BA , 2iP and TDZ (0 ، 1 ، 2 ، 3 ، 4 and 5mg/l) were used to determine shoot formation from node cultured in the initiation stage. After 8 weeks the result showed that 2mg/l BA gave (4)shoots/node, while 2iP failed in shoot formation whereas treatment with TDZ promoted callus formation. According to the results BA was used at concentration (1.5 , 2.0 and 2.5 mg/l) in combination with IBA or NAA(0 ، 0.1، 0.3 and 0.5 mg/l), the results revealed that 2.5 mg/l BA with 0.3 mg/l IBA resulted in the best result (6.6 shoots/node).

The different ratio of NH_4NO_3: KNO_3 supplemented to MS media (4:1 ، 2:1 ، 1:1 ، 1:2 ، 4:1 and MS ratio), the results showing that weighable ratio with MS gave highest number of shoots per explant . Effect of north or south pole of magnetic field (200 mT) or electromagnetic field at (0.16 mT) were studied on the node culture in MS media supplemented with 2 mg/l BA, after 8 weeks electromagnet field produced shoot number remarkably ،Northen electrom-agnetic field caused an increase in shoot length about 12٪ as compared with control. The second experiment conducted by using south pole of magnets (0 , 1 ، 2 ، 3) for three period (20 ، 40 ، 56) days for node, the results showed that high magnetic field reduced the number of shoot (3.2) when comparing to control treatment (5.2 shoots) .

Shoots were cultured on full MS or ½ MS media supplemented with IBA (0 ، 0.25 ، 0.5 and 1 mg /l), the results exhibited that ½ MS with 0.5 mg/l IBA gave the best rooting after 4 weeks . Three concentrations of sucrose (20 ، 30 and 40 g /l) or glucose (10 ، 15 and 20 g/l),the shoots exposed to darkness for 2 weeks in dark room followed by 2weeks in standard growth room conditions at 4 weeks in standard growth room conditions. The result revealed that the 20 g/l sucrose increased rooting percent to 100٪, however treatment of 40 g/l sucrose had increased roots length and dry weight, in the other word darkness reduced rooting percent and roots quality.

Four concentrations of iron chelated Fe –EDTA or Fe –EDDHA (5.6 ، 11.2 ، 16.8 and 22.4 mg/l Fe) supplemented with ½ MS media ,the results indicated that 5.6 mg/l Fe –EDDHA gave the best results in roots number, length, fresh and dry weight. The first study showed that the north pole of magnet (200 mT) had increased roots number ,length and chlorophyll density as compared with south pole or electromagnetic field (0.16 mT) or with control treatment.

In the second experiment , north pole of (0 , 1 , 2 and 3) magnets was used for three period (10 ، 20 ، 28) days, the results showed that applying one magnet for 10 days increased root length,

chlorophyll density, fresh and dry weight whereas the application of two magnets for 10 days increased roots number to (5.4) roots/shoot as compared with 3.4 roots/shoot of the control .

Plantlets were sprayed with an antitranspirant vapor gard at concentration (0 , 1 , 2 and 3 %) and liquid paraffin at concentration (0 , 1 , 2 %), the results showed that (2 or 3%) vapor gard increased leave number and plantlets survival to 90% as compared with 60% plantlets in control treatment. Stem sections revealed that the high magnetic field (south pole of three magnets) improve vascular bundle development and xylem formation and showed brown precip-itations in pith tissue. Sections of the stem basal shoot for (0 -11 days) after IBA root inductive treatment showed that the root primordial formed after 3days and cell division was increased after 5 days, vascular bundle formed after 7days , and the sections showed that the young root primordia apparently appeared from stem tissue after 11 days .

Root sections showed that Fe-EDDHA promoted the division and develop-ment of vascular bundles by increasing the number of proxylem to 5 as compared to Fe-EDTA (4 bundle) high concentration of Fe (22.4 mg/l) resulted in the formation of zygomorphic vascular bundle and brown precipitations in the cortex .Sections of roots showed that the growth and development of xylem and phloem were increased when shoots exposed to magnetic field by using 1 or 2 magnet for 10 days during rooting stage.