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Reduction of the cost of production in black pepper (*Piper nigrum* L.) tissue culture using Phytagel^R

Y M H B Yapabandara*, H M R Hennayake and N K S K Jayawickrama
Research Station, Department of Export Agriculture, Matale

Plant production of black pepper (*Piper nigrum* L.) is possible by using tissue culture technology. However, high cost of production (COP) was experienced and therefore, different avenues to reduce the COP is required prior to its commercial application. Agar is the highest cost component in culture medium, which accounts for 51.8% of the cost. Therefore, this study was undertaken to replace the high cost agar by low cost gelling agent Phytagel^R.

In vitro multiplied cultures of black pepper local selection (GK47) were used for the study. Single nodal cuttings were prepared using well grown *in vitro* shoots and introduced to 10 ml culture medium in culture tubes. The culture medium used was Murashige and Skoog (MS) supplemented with 2 mg/L BA and solidified with 7 g/L agar or 2 g/L Phytagel^R. 20 cultures as treatments were arranged in a Completely Randomized Design (CRD) with three replications. All cultures were incubated at 23±2°C under 16 h light at about 3000 lux light intensity. After 8 weeks cultures were removed and sub-cultured as single nodal cuttings in medium with similar composition (agar or Phytagel^R). Counts were taken on number of usable nodes and number of leaves produced. Data on counts were analysed using nonparametric methods, Kruskal Wallis or Wilcoxson Signed-Rank Test in SAS statistical package.

The results indicated similar number of usable node production in two media i.e., 4.5 in agar and 4.3 in Phytagel^R. The number of leaves produced was also almost similar in the two media i.e. 6.5 in agar and 5.5 in Phytagel^R.

The total cost for 1L MS agar medium was Rs. 225/- (MS salt at Rs. 120/- + Agar at Rs. 105/-) whereas the total cost of MS Phytagel^R medium was Rs. 164/- (Phytagel^R Rs. 44/-). Similar number of usable nodes was obtained from these two media. Therefore, it could be concluded that 27% of media cost could be reduced by replacement of Agar with Phytagel^R. Even with the replacement of low cost Indian agar (Himedia- Rs 8/- per g), 6.8% of the medium cost could be reduced by using Phytagel^R (Agar MS at Rs.176/-/L; Phytagel^R MS at Rs. 164/-/L).