Chapter 6

NEXT GENERATION PLANT TISSUE CULTURE SYSTEMS IN FRUIT SCIENC

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In vitro propagation techniques are an important approach for establishing rapid propagation protocols and genetic manipulation studies. In classical tissue culture techniques used for mass propagation, agar solidified or semi-solid media are used. In addition to increasing the cost of plants reproduced by tissue culture, this method may have negative effects on plant growth factor and plant quality. The most important disadvantage in nutrient intake is the absorption of nutrients from the basal parts of the shoots. However, liquid culture systems such as bioreactors are an important alternative to solid or semi-solid media. But, the fact that the explant is constantly in liquid environment brings with it many problems such as vitrification in the tissues and being damaged by being oxygen-free (Lambardi et al., 2015).

THE TEMPORARY IMMERSION SYSTEM (TIS)

The Temporary Immersion System (TIS) is a system that combines the advantages of traditional semi-solid and liquid media. In recent years, it has been used frequently in plant tissue culture studies. For this reason, we can named this technique a new generation tissue culture technique.

The advantages of temporary immersion systems (Lambardi et al., 2015):

1. Culture medium and plant contact to the nutrient medium are more uniform than conventional tissue culture systems,

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CONCLUSIONS

Temporary immersion systems have been widely used in plant tissue culture studies in recent years. Temporary immersion systems are used in fruit species, especially for micropropagation studies. Higher micropropagation rate was obtained with temporary immersion systems compared with solid medium culture in different fruit types. In temporary immersion systems, immersion / ventilation times directly affect the success. The optimum immersion / ventilation time may differ depending on the plant species. Therefore, the immersion / ventilation time needs to be optimized.

In addition to the commercially developed temporary bioreactor systems, there are also handmade bioreactor systems. These systems are suitable for mass production. Easy, inexpensive, effective temporary immersion systems will continue to be developed in the coming years.

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