

Role of biotechnology in the development and improvement

Technology



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Misappropriation is the practice of rapidly multiplying stock plant material to produce a large number of progeny plants, using modern plant tissue culture methods. Misappropriation is used to multiply novel plants, such as those that have been genetically modified or bred through conventional plant breeding methods. It is also used to provide a sufficient number of plants for planting from a stock plant which does not produce seeds, or does not respond well to vegetative reproduction. Cornell University botanist Frederick Champion Steward discovered and pioneered micropropagation and plant tissue culture in the late 1950s and early 1960s. Misappropriation begins with the selection of plant material to be propagated. Clean stock materials that are free of viruses and fungi are important in the production of the healthiest plants.

Once the plant material is chosen for culture, the collection of explants(s) begins and is dependent on the type of tissue to be used; including stem tips, anthers, petals, pollen and other plant tissues. The explants are washed, and finally rinsed in sterilized water. This small portion of plant tissue, sometimes only a single cell, is placed on a growth medium, typically containing sucrose as an energy source and one or more plant growth regulators (plant hormones). Usually the medium is thickened with agar to create a gel which supports the explants during growth. Some plants are easily grown on simple media, but others require more complicated media for successful growth; the plant tissue grows and differentiates into new tissues depending on the medium.

For example, media containing cytokines are used to create branched shoots from plant buds. TISSUE CULTURE Tissue culture generally refers to the <https://assignbuster.com/role-of-biotechnology-in-the-development-and-improvement/>

growth of cells from a tissue from a literature organism in vitro. These cells may be cells isolated from a donor organism, primary cells, or an immortalized cell line. The term tissue culture is often used interchangeably with cell culture. The literal meaning of tissue culture refers to the culturing of tissue pieces. This is typically facilitated via use of a liquid, semi-solid, or solid growth medium, such as broth or agar. Tissue culture commonly refers to the culture of animal cells and tissues, with the more specific term plant tissue culture being used for plants.