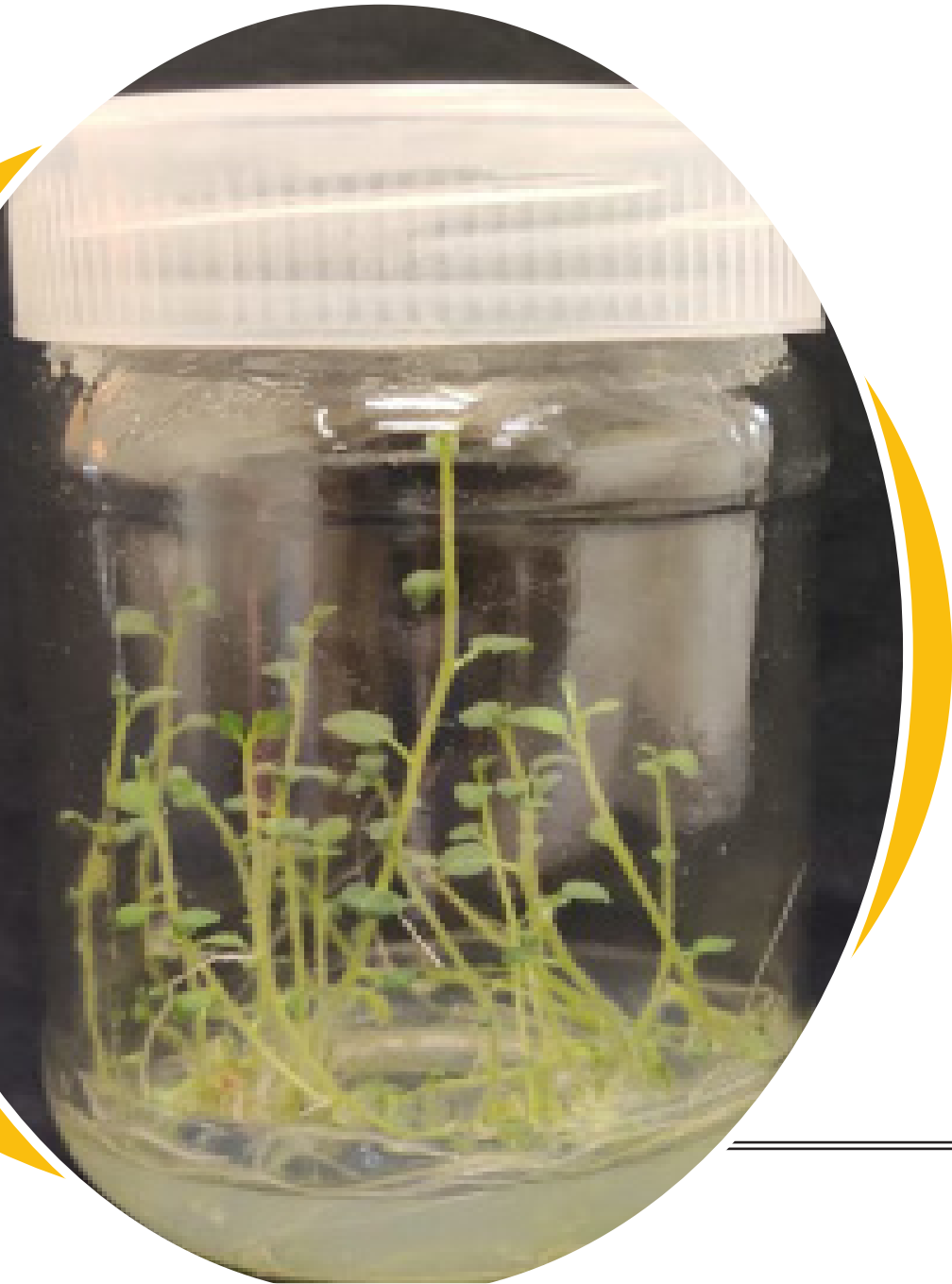




TISSUE CULTURE TECHNOLOGY FOR RAPID MULTIPLICATION OF CERTIFIED SEED POTATO





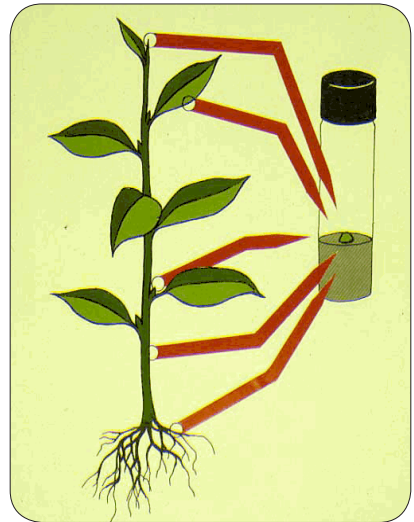


Introduction

Good quality healthy seed is essential for the timely availability of certified seed potato to farmers. Due to high seasonal demand for over 30,000 metric tons of seed potato, there is a need to increase quantities of initial parent stocks (minitubers or rooted apical cuttings) that would be bulked in the field for several cycles to obtain certified seed potato. Among the techniques explored to achieve this is tissue culture technology. Tissue culture is the production of new plants through the growing of plant cells, tissues and organs in artificial/soilless media in laboratory conditions. This method uses a synthetic growth medium which stimulates the growth of axillary buds.



Invitro plantlets in testtubes

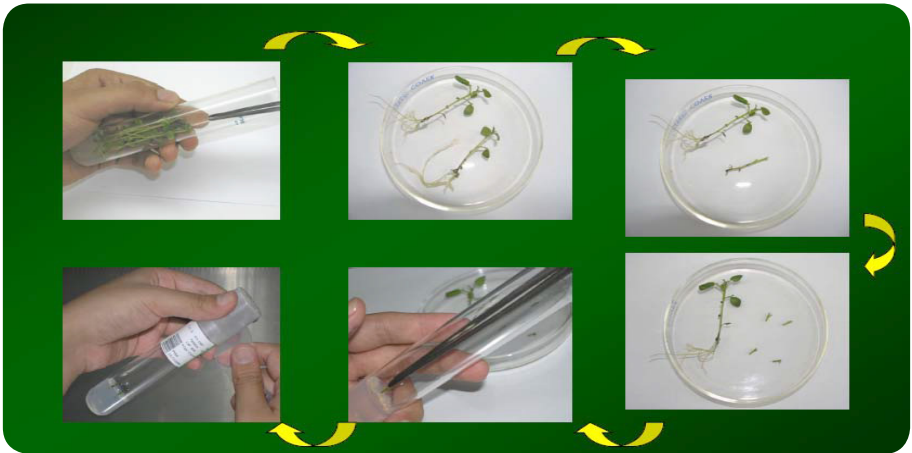


The different nodal cutting points from an invitro plantlets



Importance of tissue culture in potato

- Provides healthy planting material to farmers and researchers and therefore fast or quick availability of high-quality planting materials
- To establish and maintain disease-free parent stock
- Ability to achieve large quantities through mass production (large-scale production)
- Preservation of genetic purity- genetically identical plants are produced



Introducing new plant cells/tissues in new artificial media under laboratory conditions

How tissue culture works

An initial single meristem cell is inoculated in test tubes containing sterile growth media. When the cell grows into a plantlet, the plantlet is removed from the test tube and placed on a sterile petri dish or working surface. Using a scalpel blade, nodes are cut and transferred onto freshly prepared growth media, ensuring that the cutting is in good contact with the surface of the growth medium contained in Kilner jars.



The Kilner Jars are then transferred to the growth room to allow new plantlets to form. The ideal growth room conditions include a temperature of 19-22°C with 16 hours of light supplied by lux-fluorescent tubes. However, it is possible to grow plantlets in front of a window as long as they are protected from strong direct sunlight.

Hardening section

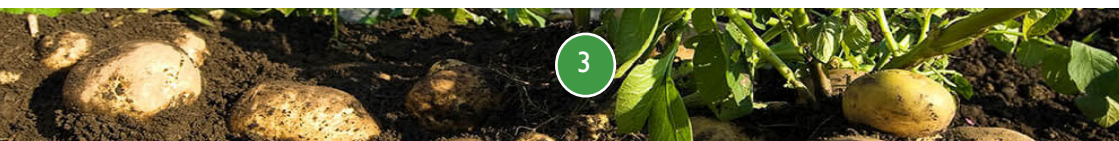
- The tissue culture process lasts for six weeks when the *in vitro* plantlets are considered mature and are transferred to the hardening section.
- Highly quality seed minitubers (pre-basic seed) are produced by removing *in vitro* plantlets from jars under laboratory conditions, washing off artificial media and then planting them into a seed bed containing appropriate planting media under screen house conditions, to harden them for outdoor conditions.
- While in this section, high relative humidity is important, especially on the first day following transplanting. Care must be taken to water the young plants with fine mist especially when temperatures are high and to protect them from disease infections.



Plantlets from tissue culture in the hardening stage



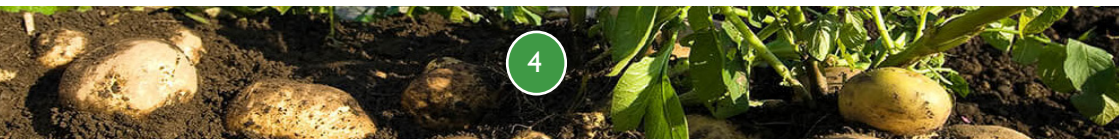
Plantlets have established and ready for minituber production





Conventional pot method for minituber production

In the hardening stage, the plantlets establish and become strong. Afterwards, they may be transferred to conventional pot methods, aeroponics, hydroponics or rooted apical cuttings for the production of minitubers.





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