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**280. © Plant tissue culture: challenging micro-organisms.** van Asch, M. International Plant Propagators' Society, combined proceedings, 2010, 60:77-80. 2011.

## Plant Tissue Culture: Challenging Micro-Organisms®

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**Plant tissue culture is aimed at propagation of plant material; this is done by growing plantlets under sterile conditions. The major problem is to get plant material to grow under sterile conditions. To achieve this stage one has two stumbling blocks; firstly the plant material needs to be surface sterilised to the extent that no contaminants will occur on the culture medium and secondly a culture medium needs to be found that encourages the plant material to grow!**

**For step one, various agents are used and they all have their advantages and disadvantages. The general principle is that the fungi and bacteria which are on, and sometimes in, the plant tissue are being killed, while the plant material itself stays alive. There are no strict rules for this treatment; it depends on the size and structure of the desired plant material.**

**Once the material is growing without any visible infecting agents, the propagating of the material can start. This requires finding a culture medium that will encourage side-shoot formation and at a later stage, root-induction. The plant material will be “fed” by supplying macro and micro elements, vitamins and sugars in the culture medium.**

**The final product from the laboratory will need to be hardened off; which means that the plant material, that we so carefully manipulated to become free of micro-organisms, needs to be introduced to these organisms again, while at the same time it needs to be “taught” to use its own roots and photosynthesis for growth.**

### INTRODUCTION

This presentation is aimed to give you a better understanding about the process they call plant tissue culture. In principle, the procedure is nothing else than taking cuttings of plant material and by doing so; increasing the amount of plant material. Mainstream tissue culture does not do anything with the product itself; what you put in, will come out.

In tissue culture there are four main problems:

- 1) To get the plant material clean enough to grow on culture medium
- 2) To figure out which type of culture medium the crop requires
- 3) To keep the plant material free of fungi and bacteria during this process
- 4) To get the plant back from the tube into the soil

Firstly, before anything else, one needs to realise that, in theory, one single plant cell will be able to produce a complete plant structure. Failing to have a plant, or cutting, to respond in the anticipated way is basically our ignorance, not the plant's fault! However, since sometimes we are not able to figure out the plant's requirements, we cannot propagate that plant material.