



**TCPROPAGATIONLTD**

M I C R O P R O P A G A T I O N

**SYSTEM**

The use of the *Plantform*® bioreactor in reducing the capital and running cost of large scale commercial micropropagation laboratories

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# Large Scale Micropropagation

- **In conventional labs gelled sterile medium in rigid containers (plastic or glass)**
- **Expensive autoclaves needed**
- **Efficient air condition system required**
- **Demanding stable supply of electricity and heavy in power use**
- **It is labour intensive industry**
- **Due to this capital demanding, setting up new labs are limited in developing areas, though labour is available**

# Conventional Lab



www.alamy.com - EPCPJN

# *Bioreactors*

- **Bioreactor is an engineered device that supports a biologically active environment in which a biological reaction or process is carried out, especially on an industrial scale**
- **They are designed in many forms and from simple to most complicated systems.**
- **Temporary Immersion system is simple and producing high quality plants**

# Plantform Bioreactor

- Designed to answer problems
- Easy to assemble after cleaning
- Easy to manipulate in planting and harvest
- Larger head space
- Low pressure pump to protect filters
- Plants harvested harder due to active aeration.
- Low cost system
- Modular and expand as needed
- Used in research and production

The figures below show the construction and details of the bioreactor



1. Outer container with 3 inlets/outlets for gas exchange ,2E shows the middle filter connected to a plastic tube on the inner chamber, 3 fibers, plastic tubes, clamps, nuts and silicon rings to be connected to the 3 inlets/outlets on the outer container, 4A inner chamber with 3 grooves on the long side and connection to the middle filter, 5B basket with 3 rows of small holes, 6C frame with 4 legs, 7 lid with 4 flaps and an inner silicon ring.

# Plantform Bioreactor



## Complete set of 12 bioreactors

700 Euro + freight costs

- 12 bioreactors
- 2 timers
- 1 pump, 5w
- 1 pump, 10w
- 1 electric valve
- 6 green and 6 white 4-ways connectors
- 2 green and 2 white 3-way connectors
- 2 stoppers
- 7 green and 7 white 17cm cut silicon tubes for horizontal connection
- 4,5m extra silicon tube for vertical connection



The table shows differences in mineral nutrient concentrations before cultivation (start) and after four weeks of TIS cultivation (final) in *Digitalis*, *Echinacea* and *R. idaeus*. Analyses of all mineral nutrients were performed with ICP (inductively coupled plasma emission), except for analyzing of nitrogen that was executed with FLA (flow injection analysis).

Substance	<i>Digitalis</i> (mg/l) Lep.		<i>Echinacea</i> (mg/l) Lep.		<i>Rubus</i> (mg/l) MS	
	Start	Final	Start	Final	Start	Final
Nitrate-nitrogen	390	295	360	209	510	408
Ammonium-nitrogen	82	25	82	32	270	195
Phosphate	65	52	65	49	38	28
Potassium	660	510	660	527	650	552
Sulfate-sulfur	33	28	33	28	34	29
Calcium	130	110	130	110	110	93
Magnesium	24	21	24	19	23	20
Iron	4.7	1.2	4.7	0.65	4.6	0.72







# TC Pouches

- **Originally designed for long term storage of cultures**
- **Made of special polymer of 2 types**
- **Shaped to allow ease of:**
  - **filling with medium**
  - **ease of manipulation**
  - **cost effective**

# Pouches



# Our Low Cost System

- **Uses**
- **Laminar flow Cabinet**
- **Small autoclave**
- **Microwave oven**
- **Impulse heat sealer**
- **TC Pouches**
- **Plantform Bioreactor Production Unit**
- **Use of LED white light**





# Production unit











# Raspberry

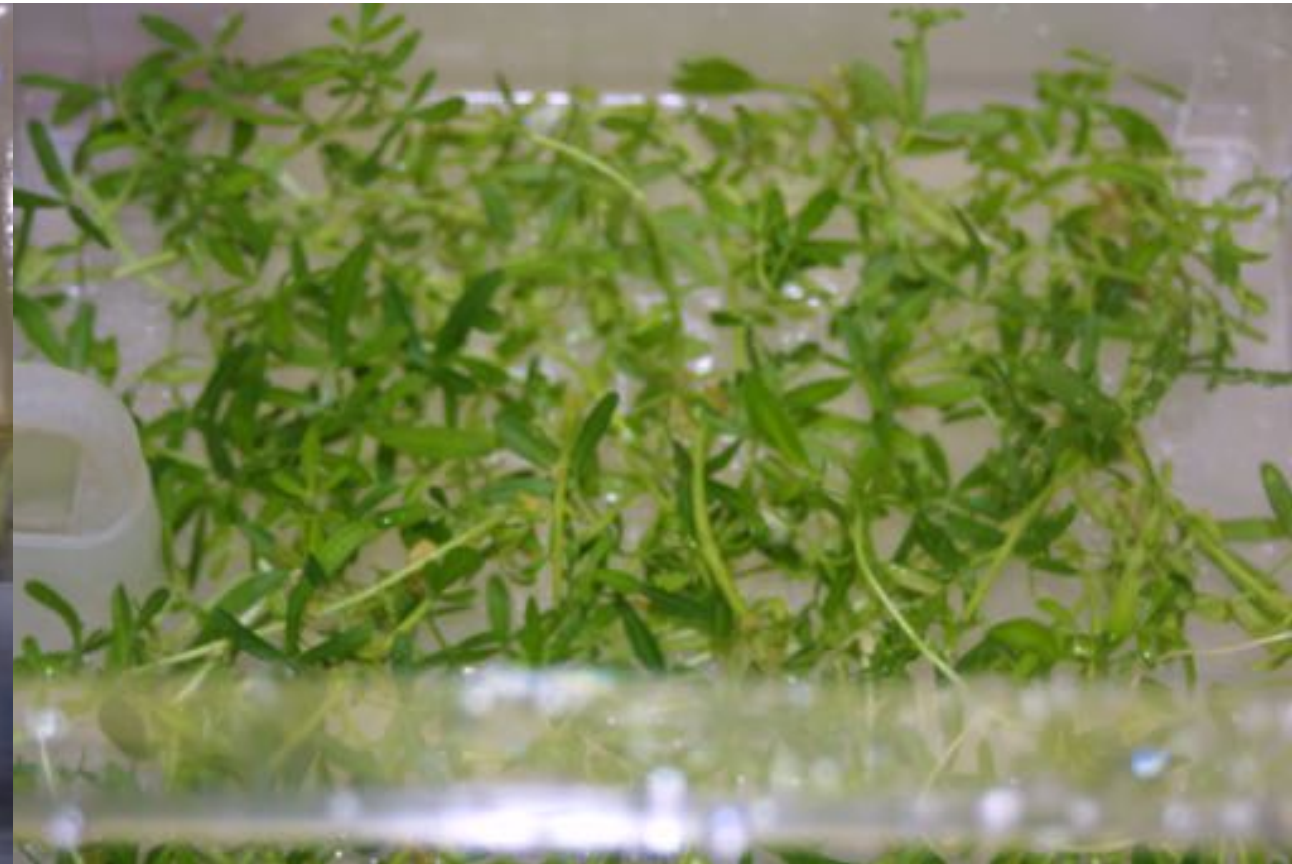
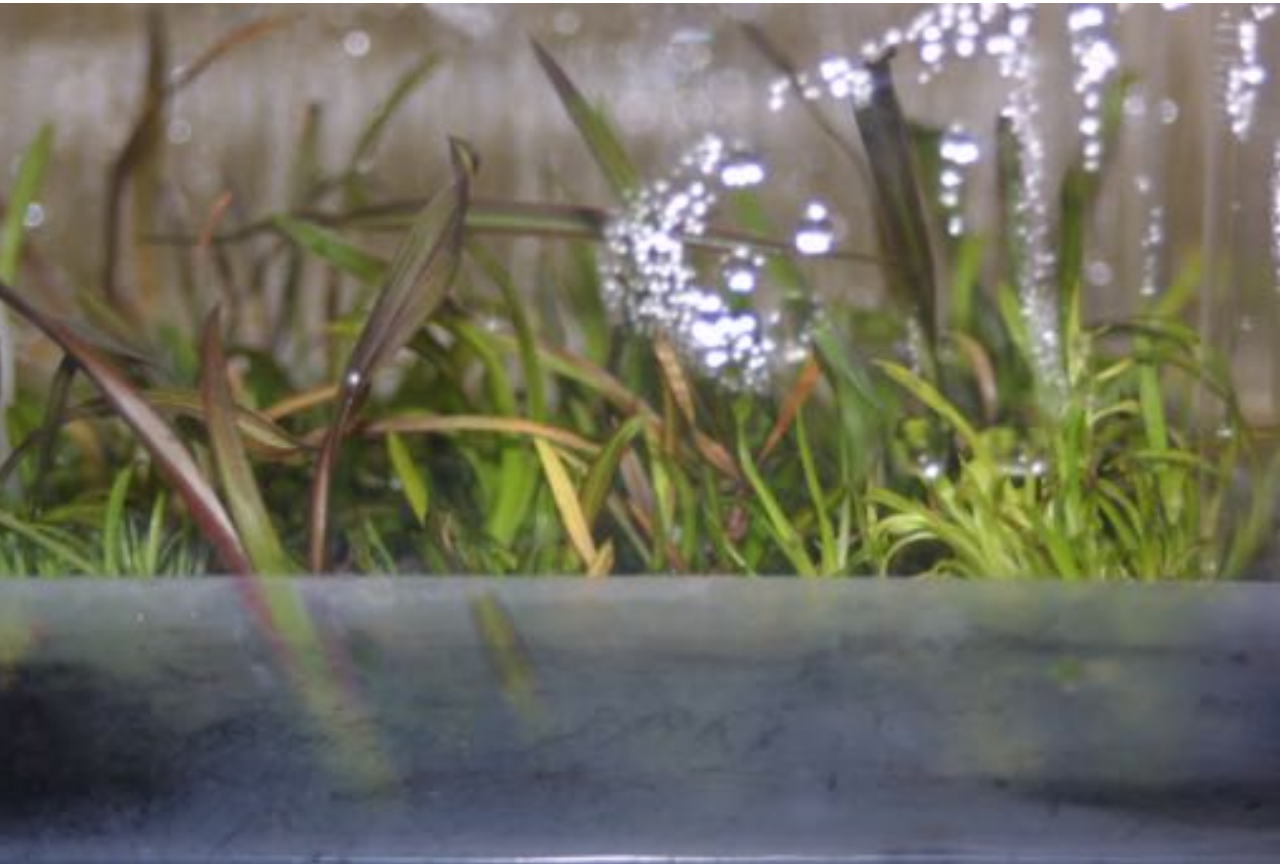






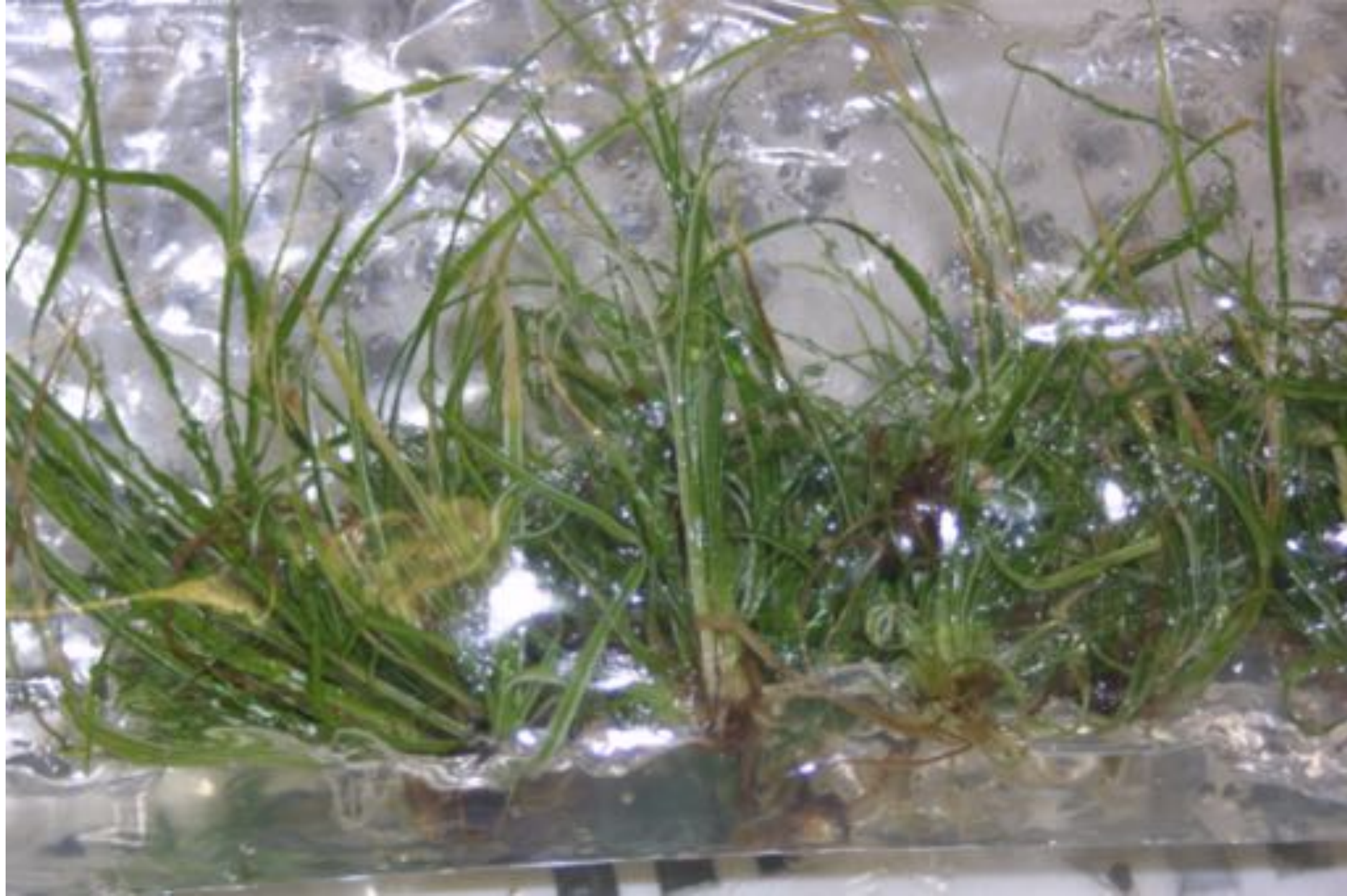


# Phoridium



Carex









# Transfer



Potato tuberisation





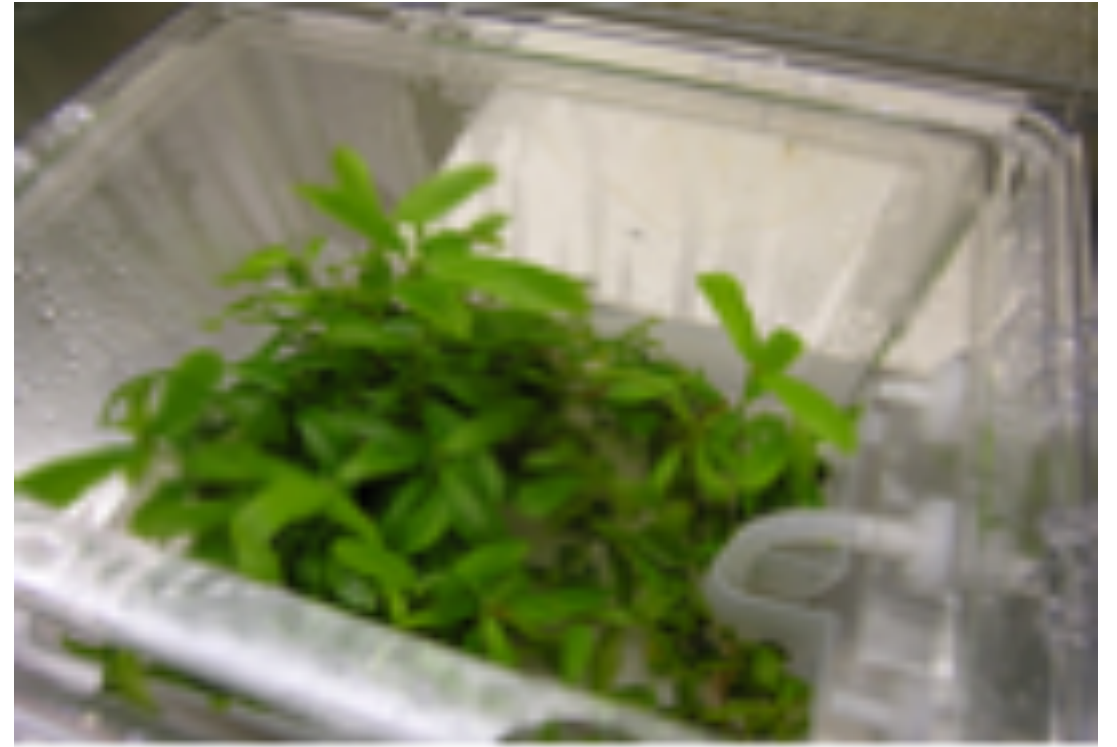
***Olea europaea***



**Raspberry**



**Hebe**



**Chestnut**

**African violet**



**Datepalm**



# Primula

