Development of a SAV Tissue Culture Protocol for Restoration of Marine Habitats

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Center for the Inland Bays
Scientific & Technical Advisory Committee
3 Common SAV Restoration Pitfalls

- Lack of plant material supplies
- Local plant population
- Plants with specific characteristics for the restoration site
Plant Tissue Culture 101
Totipotent

*Every* plant cell has the potential to divide and produce all the cells to build a new organism.
Plant Tissue Culture 101

Donor Plant

Explant

Culture Dish

Media

Micropropagation

Callus Induction
Plant Tissue Culture 101

- **Micropropagation**: Initial stage where growth is induced in a controlled environment.
- **Callus Induction**: Process where callus tissue is induced from the initial propagules.
- **Differentiation**: Final stage where the callus tissue differentiates into mature plants. 

Propsules
Seagrass Tissue Culture & Restoration
Plant Material Source

- Less collection & more material
- Uses the local genotype
- Guaranteed availability
Selective Cultivars

These plants could...

- Survive more turbidity?
- Withstand nutrient loading?
- Higher root:shoot ratio?
Band-Aid Crop

Seedling alone

Band-Aid Crop
Genotype Banking

Indian River Inlet Bridge Construction

Dredging

www.faust-corp.com
Tissue Culture & Research

• *In vitro* studies of uptake and production

• Microbial community dynamics

• Diagnosis of future events
Development of a Tissue Culture Protocol
Halophyte Biotechnology Center
The NOAA/UNH Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET)
Field Collection
Back To The Lab...
A Two-Tract Approach

Micropropagation

Callus Induction
2-Phase Media

Liquid top media layer

Solid bottom media layer

2-Phase media for micropropagation / shoot proliferation
Sterilization Technique

- Ethanol
- 10% Betadine
- 0.2 mg/L erythromycin
Sterilization Technique

The Result:

Contaminated culture

Sterile culture
Common Bacterial Association

16S rRNA gene sequence data and fatty acid analysis revealed *Thalassospira* spp.
Current/ Future Strategies

• New hormone combinations for micropropagation

• Hormone pulse method

• Organic media nutrients
## End-User Advisor Roll

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
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<tr>
<td>Ben Anderson</td>
<td>DNREC</td>
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<tr>
<td>Otto Bundy</td>
<td>Environmental Plant Resources, Inc.</td>
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<tr>
<td>Beau Williams</td>
<td>Seagrass Recovery, Inc.</td>
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