BGREEN
Building a Regional Energy and Educational Network

A Partnership to Integrate Efforts and Collaboration to Shape Tomorrow’s Hispanic Sustainable Energy Leaders

Agriculture BGREEN Group
Faculty Supervisor: C. R. Richardson
## Personnel

<table>
<thead>
<tr>
<th>Faculty Supervisor</th>
<th>Undergraduate Students</th>
<th>Graduate Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richardson, C. R.</td>
<td>Contreras, A. J.</td>
<td>Hoitt, C. B.</td>
</tr>
<tr>
<td></td>
<td>Gaffney, C. B.</td>
<td>Cervantes, M. A.</td>
</tr>
<tr>
<td></td>
<td>Garcia, D. S.</td>
<td>Martinez, S. P.</td>
</tr>
<tr>
<td></td>
<td>Gonzalez, Q. R.</td>
<td>Riggs, S. B.</td>
</tr>
<tr>
<td></td>
<td>Gurerra, M. F.</td>
<td>Galvan, H.</td>
</tr>
<tr>
<td></td>
<td>Herrera, A. S.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Firova, D. J.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Juarez, M. E.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Juarez, M. I.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manibusan, M. J.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Molina, E. M.</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Total Students Involved</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>
The Agriculture BGREEN Story
Posters & Abstracts

• BGREEN- Farm in a Box “Design”
• Promote sustainability
• Small scale demonstration
• Water availability
• Floating gardens
• Next generation of water sustainability
• Inoculation
• Soil Sifting
Project Focus
and Student Involvement

• Focus: Shape tomorrow’s Hispanic sustainable energy leaders

• Student Involvement
  ▪ Participate in brainstorming and planning meetings
  ▪ Participate in BGREEN plant research trials
  ▪ Participate in data analysis
  ▪ Preparation of posters and abstracts on BGREEN research
  ▪ Preparation of articles for publication
Design and Use of BGREEN Farm in a Box to Produce Vegetables in South Central Texas


Objectives:

• Demonstrate maintaining a vegetable farm in a limited space
• Evaluate benefits of gardening with probiotics and using a raised bed
• Appraise potential of BGREEN Farm in a Box for Hispanic families
Design and Use of BGREEN Farm in a Box to Produce Vegetables in South Central Texas

Results from garden bed with mycorrhizae

TREATMENT BOX 1

- Tomato
- Pepper
- Okra
- Corn

Heights (cm) vs. Weeks

Raised garden bed
Inoculation: Medical Break Through or Agricultural Break Through

Objectives:

• Can plants that do not have a relationship with the Rhizobium bacteria be inoculated with a strain of the bacteria and sustain nitrogen fixation?

• Would this be an affordable solution to crop improvement

• Determine if inoculating different fruits and vegetables will provide more efficient edible crops

• Evaluate supplemental income, and self-satisfaction indicators in financially burdened communities
Inoculation: Medical Break Through or Agricultural Break Through

Why use mesquite trees?
- Adapted to survive in arid conditions
- It is a phreatophyte
- Roots can grow long to acquire water
Objectives:

• To identify how you can promote the sustainability of Farm in a Box
• Promote this method to those in Hispanic Homes
• Provide the information needed to promote and make it widely known
Farm in a Box has been demonstrated and results indicate that this strategy can be valuable in sustaining home vegetable production.
The Texas Stock Tank and its Uses for BGREEN Benefit for People, Livestock and Wildlife
S. B. Riggs, C. B. Hoitt, S. P. Martinez, and C. R. Richardson

Objectives

• Evaluate water availability for animals
• Evaluate water source for sustainable vegetable gardens
• Identify methods and procedures needed to improve long-term water availability
• Disseminate information at the county and state level
The Texas Stock Tank and its Uses for BGREEN Benefit for People, Livestock and Wildlife
Small Scale Demonstration and Benefits of Producing Vegetables in BGREEN Boxes
M. E. Juarez, M. A. Cervantes, C. B. Hoitt, S. P. Martinez, and C. R. Richardson

Objectives:
• Observe the way the plants benefit and aid each other’s growth
• Harvest corn, beans and squash
• Donate harvested crops to the Hay’s County Food Bank to help the less fortunate and feed the hungry
Small Scale Demonstration and Benefits of Producing Vegetables in BGREEN Boxes
Objectives:

• Recreate the chinapma into a more modern, easy, and affordable way

• Test if this method of agriculture proves to be a competitive alternative to traditional land methods

• Find ways to improve utilization of land space covered by water

• See if floating garden beds can be an alternative way to grow plants that have major pest problems
Floating Garden Beds

Preliminary Results:

• Floating garden beds have reduced the need for irrigation systems and the time one would spend on setting up an irrigation system as well as time spent turning the irrigation system on and off.

• Floating gardens may be a way to grow corn and other crops that usually do not do well in this area due to pests.

• This new take on ancient growing methods could be a way to revitalize these methods as well as utilize land more efficiently.
Objectives

• Determine how effective this device is
• Determine who will benefit from this device
• Determine how difficult the building process is
The Next Generation of Water Sustainability
Objectives:

• To remove unwanted material from soil such as rocks, large clay particles, parasitic larvae, and debris
• To create wide rows, deep soil, and raised beds
Soil Sifting Your Garden
Summary

• Total of 16 enthusiastic students were involved
• Internal internships were successfully completed
• Student research involvement was high
• Four undergraduates are now in graduate school
Conclusions

• Students were able to see, feel, and touch concepts and aspects of this BGREEN project

• Undergraduate student education and research exposure was developed

• Graduate student professional development was apparent
Implication

Student involvement in the BGREEN project increased awareness in sustainable agriculture and should be a positive factor in tomorrow’s Hispanic leaders in Texas