**Problem:** Worcester is in a stage 3 drought

**Cause:** Meteorological conditions

**Impact:** Government has to import more water

**Problem Case:** Worcester Agriculture
- 2 organic farms
- 62 community gardens
- Inefficient sprinkler and hose irrigation

**Solution: Hydroponics**
Compared to traditional growing methods, hydroponics use:
- 90% Less Water
- 83% Less Nutrients
- 90% Less Area

Implementing hydroponic systems at Worcester farms and gardens would conserve water and help mitigate drought conditions

**Evaluating Hydroponic Systems**

<table>
<thead>
<tr>
<th>Weighting for Farms</th>
<th>Weighted Criteria</th>
<th>Weighting for Gardens</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>Yield</td>
<td>10%</td>
</tr>
<tr>
<td>20%</td>
<td>Affordability</td>
<td>50%</td>
</tr>
<tr>
<td>10%</td>
<td>Water efficiency</td>
<td>5%</td>
</tr>
<tr>
<td>10%</td>
<td>Plants per square foot</td>
<td>5%</td>
</tr>
<tr>
<td>10%</td>
<td>Educational value</td>
<td>25%</td>
</tr>
<tr>
<td>10%</td>
<td>Durability</td>
<td>5%</td>
</tr>
</tbody>
</table>

**Systems for Comparison**

- **Commercial AmHydro System**
  - 288 plants per week
  - $3,495 initial cost
  - extremely water efficient
  - 4.8 plants per ft²
  - harder to build/replicate
  - extremely durable

- **Homemade System**
  - 0.5 plants per week
  - $40 initial cost
  - fairly water efficient
  - 0.5 plants per ft²
  - easy to build/replicate
  - not very durable

**Implementation in Farms**
- Utilize existing infrastructure
- Apply for SARE Grants
- Create a sustainable business model

**Implementation in Gardens**
- STEM education curriculum
- Simple fundraising efforts
- Adapt for home use

We would like to thank Joe Swartz of American Hydroponics, Bettny Mazur of the Worcester REC, and Friends of the Greenhouse Schenectady for providing their time and expertise to help us with our project.

**References**

http://upload.wikimedia.org/wikipedia/commons/e/e2/Lufa_Farms_Bok_Choy_in_NFT_System.jpg
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