Advantages and Disadvantages of Windbreaks

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Advantages

- Canker reduction
- Wind scar reduction
- Wildlife habitat
- Reduce wind/soil erosion
Disadvantages

- Loss of space
- Shading effects
- Competition for water and nutrients
- Establishment costs
- Maintenance costs
- Complicates equipment movement
- Effects on microclimate, pest populations, etc
Purpose of windbreaks for canker control

- Reduce spread of canker
- Most importantly, reduce canker severity
Important Characteristics of Windbreaks

- Reduce wind speed to less than 20 mph (or 8 m/s)
- Avoid high density, no need to stop the wind, just slow it down
- Avoid very tall windbreaks, shade excessively, susceptible to breakage
- Windbreak distance effects
  - 10X the height of windbreaks downwind, some upwind effect as well
Effect of wind exposure on canker infection in Argentina - Grapefruit

<table>
<thead>
<tr>
<th>Tree Sector</th>
<th>Leaves</th>
<th>Fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW</td>
<td>8.2 a</td>
<td>82 a</td>
</tr>
<tr>
<td>NW</td>
<td>2.5 b</td>
<td>43 b</td>
</tr>
<tr>
<td>SE</td>
<td>2.9 b</td>
<td>15 c</td>
</tr>
<tr>
<td>NE</td>
<td>1.1 b</td>
<td>6 c</td>
</tr>
</tbody>
</table>

Predominant winds from SW
## Internal windbreak effects with Marsh Grapefruit

<table>
<thead>
<tr>
<th>Row</th>
<th>Exposure</th>
<th>Leaves</th>
<th>Fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Exposed</td>
<td>4.3 ab</td>
<td>32 b</td>
</tr>
<tr>
<td>B</td>
<td>Protected</td>
<td>2.7 bc</td>
<td>9 b</td>
</tr>
<tr>
<td>C</td>
<td>Protected</td>
<td>1.1 c</td>
<td>19 b</td>
</tr>
<tr>
<td>D</td>
<td>Protected</td>
<td>5.2 a</td>
<td>23 b</td>
</tr>
<tr>
<td>E</td>
<td>Prevailing Winds</td>
<td>5.0 a</td>
<td>91 a</td>
</tr>
</tbody>
</table>
Timmer and Gottwald, 1992
Windbreaks (*Grevillea robusta*) are essential to reduce the effect of windblown rain on infection.
Casuarina windbreak for grapefruit in Salta, Argentina (NW) reduces canker incidence to a trace
## Trees/Shrubs

- Southern Red Cedar
- Pines (multi row, stratified)
- Eucalyptus
- Non-spreading Bamboo
- Wax myrtle
- Viburnum
**Exposure**: Old nursery was located next to citrus. Windbreak placed on side next to the grove.
Need for windbreaks, size of area surrounded

- Fresh citrus, grapefruit, early oranges
  - Windbreaks around each 5 – 10 acres, preferably all sides

- Processing – Early oranges-Valencias
  - 30 ft windbreaks each 300 ft effect
  - Down the row only
Citrus Windbreaks
Double rows of citrus on outside rows
every 300ft
Recommendations

- Plant windbreaks now for fresh market grapefruit and early oranges.
- Plant windbreaks in available space along fence rows, ditches, wetlands for processed fruit.
- Use available species such as pines for the moment until availability is greater for other species.