Horticultural Aspects of Tomato Production under Protected Culture

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<table>
<thead>
<tr>
<th>Country (year)</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Europe</strong></td>
<td></td>
</tr>
<tr>
<td>Spain (2010)</td>
<td>35,100</td>
</tr>
<tr>
<td>Netherlands (2008)</td>
<td>3697</td>
</tr>
<tr>
<td><strong>North America</strong></td>
<td></td>
</tr>
<tr>
<td>Mexico (2005)</td>
<td>7500</td>
</tr>
<tr>
<td>Canada (2010)</td>
<td>1625</td>
</tr>
<tr>
<td>United States (2010)</td>
<td>875</td>
</tr>
<tr>
<td><strong>Central and South America and the Caribbean</strong></td>
<td></td>
</tr>
<tr>
<td>Argentina (2003)</td>
<td>2500</td>
</tr>
<tr>
<td>Guatemala (2011)</td>
<td>250</td>
</tr>
<tr>
<td>Dominican Republic (2009)</td>
<td>75</td>
</tr>
</tbody>
</table>
Greenhouses: Metal
Greenhouses: Wood
High tunnels
Why Using Structures?

- Premium prices for certain tomato types (i.e. vine-ripe clusters).
- Soilless culture = no fumigation.
- Stable environment against rain and wind.
Challenges

Structure prices:
- Greenhouses: At least $100K/acre.
- High tunnels: At least $20K/acre.

Clear identification of the markets.

Technical knowledge.
Aspects to Consider

- Ventilation
- Tomato types
- Soilless media
- Irrigation and fertilization
- Pruning, training, kneeling and tying
- Pollination and pest management
- Harvesting
Tomato Types
Tomato Types
Ventilation
Ventilation
Ventilation
Soilless Media

▷ No fumigation!
▷ None to little soilborne diseases, nematodes and weeds.
▷ Know your medium!
Soilless Media

▲ Mineral:
- Vermiculite, perlite, rockwool.

▲ Vegetal:
- Coconut coir, pine bark, peat.
- Burned rice hulls, compost.
Containers: Bags
Containers: Troughs and Boxes
Containers: Trenches
Cultural Practices: Tying and Trellising
Cultural Practices: Kneeling and Pruning
Cultural Practices

- **Pruning**: 1 main stem/plant.
- **Density**: 8000 - 12000 plants/acre.
- **In-row distance**: 8 - 10 inches.
- **Pollination**: Bees or vibration.
- **Fruit thinning**.
Irrigation: Delivery
Irrigation

- **Frequency:** 2-12 times/day.
- **Volume:**
  - Crop stage.
  - Temperature, RH, evaporation, wind, medium.
  - Mature plants: 0.5 gal/day.
Irrigation: Monitoring Equipment
Fertilization: Injection Equipment
Fertilization: Injection Equipment
Fertilization

▲ Frequency: 2-5 times/day.

▲ Rates:

- 1100-1900 lb/acre of N.
- 250-400 lb/acre of P.
- 1400-2000 lb/acre of K.
Harvesting

- Weekly or biweekly harvests.
- Starting at 5-6 weeks after transplanting.
- 20-30 harvest during the season.
Harvesting

70-150 ton/acre.
Thanks!! Questions?
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