Hydroponics

11:00-12:30  Fine Tuning Nutrient Solution and Irrigation Management
2:00-3:00    Choosing Varieties for Hydroponic Production
4:30-5:30    Biological and Chemical Insect Control in Greenhouses
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For more information on Small Farms, visit our website at: http://smallfarms.ifas.ufl.edu or contact your local County Extension Agent.

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Fine Tuning Fertigation by Using Leachate Quantities to Determine Nutrient Solution Application Rates

Jim DeValerio
Bradford County Extension
July 28, 2012
REMEMBER:
5 to 10
BIG FAT HEN!
Definitions

**Fertigation:** Soluble fertilizers applied through irrigation.

**Leachate:** Lost soluble fertilizer that runs out of the bottom of the plant container.
Can be used with any containerized system

Bato Buckets

Lay – flat Bags

Typical Flower Pot

Florida Small Farms and Alternative Enterprises Conference

University of Florida IFAS Extension
The Goal

The leachate should always be 5 to 10% of the total nutrient solution applied.
How do you measure the leachate?

In this example, the leachate would be the amount of nutrient solution collected in the pot underneath the elevated pot.
How do you estimate the total amount of nutrient solution applied?

**Measure it.**
Run an emitter to an empty container and catch the fertilizer solution that would have been applied to a containerized plant.
How to prevent under-irrigating?
• Check water delivery daily (you will need to do this so you can determine when to measure the leachate).

• A simple check to see if there is any leachate is a good place to start.

• If there is no leachate, increase the fertigation event duration or the number of events.
REMEMBER:
5 to 10
BIG FAT HEN!
How to prevent OVER-irrigating?

Manage fertigation so you maintain a 5% to 10% leachate loss
Leachate monitoring in Bato bucket production
<table>
<thead>
<tr>
<th>Plant Stage</th>
<th># of watering events per day</th>
<th>Watering event duration (min) (rate = 4oz/min)</th>
<th>Total Oz / day</th>
<th>5% to 10 % Leachate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transplant (fall)</td>
<td>3</td>
<td>0.5</td>
<td>6</td>
<td>0.3 to 0.6</td>
</tr>
<tr>
<td>2 weeks</td>
<td>3</td>
<td>1</td>
<td>12</td>
<td>0.6 to 1.2</td>
</tr>
<tr>
<td>Flowering (winter)</td>
<td>3</td>
<td>2</td>
<td>24</td>
<td>1.2 to 2.4</td>
</tr>
<tr>
<td>Flowering (early spring)</td>
<td>4</td>
<td>2</td>
<td>32</td>
<td>1.6 to 3.2</td>
</tr>
<tr>
<td>Flowering (late spring)</td>
<td>5</td>
<td>2</td>
<td>40</td>
<td>2.0 to 4.0</td>
</tr>
</tbody>
</table>
Things that will mess up your math!

Increasing/decreasing day lengths
Cloudy days
Extreme hot or cold spells
Plant growth stage
Equipment failures (broken pumps, power failures, clogged emitters)
Risk of managing below 5% leachate loss
Leachate monitoring in lay-flat bags

Fertilizer solution catch container. 1/6 of total since the leachate from 6 emitters are being caught in the tray.
REMEMBER: 5 to 10 BIG FAT HEN! Go Gators!