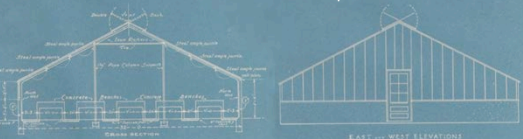


University of New Hampshire  
Cooperative Extension


## Nutrient monitoring and Nutrient Disorders

Brian A. Krug  
University of New Hampshire




### How Do We know Its Nutritional Problem?

- Patterns!




### Patterns in the Greenhouse

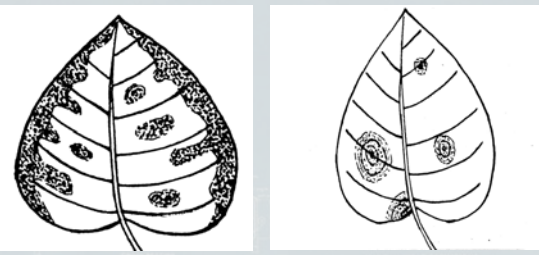


### Patterns on the Plant

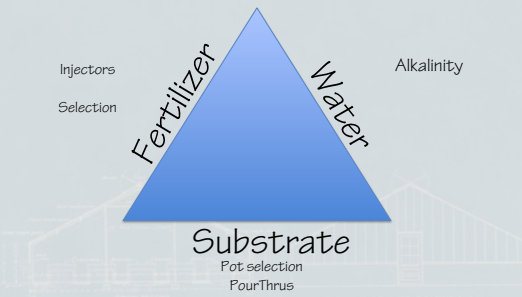
- Top of the plant
- Middle of the plant
- Bottom of the plant

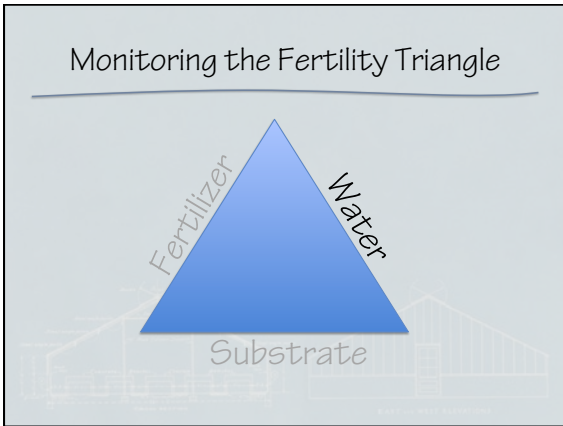


### Patterns on the Plant

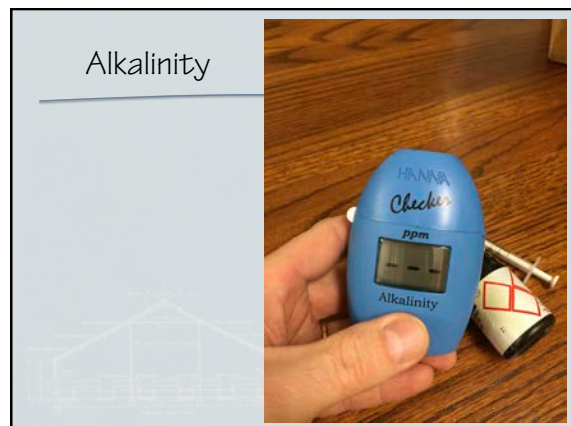
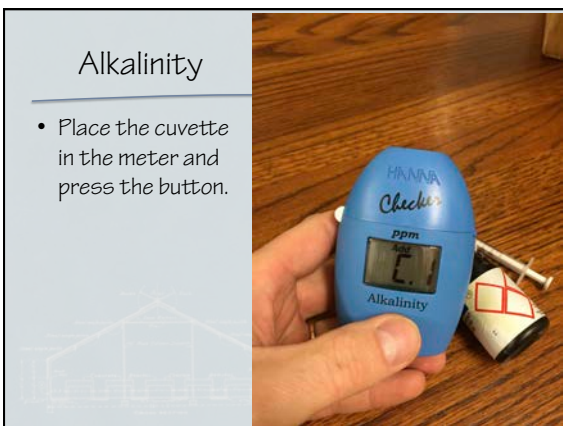


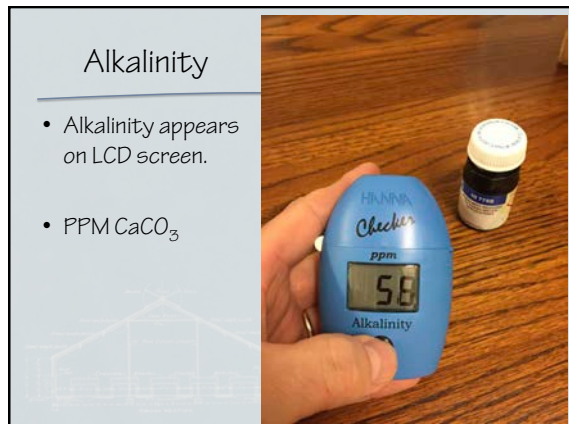
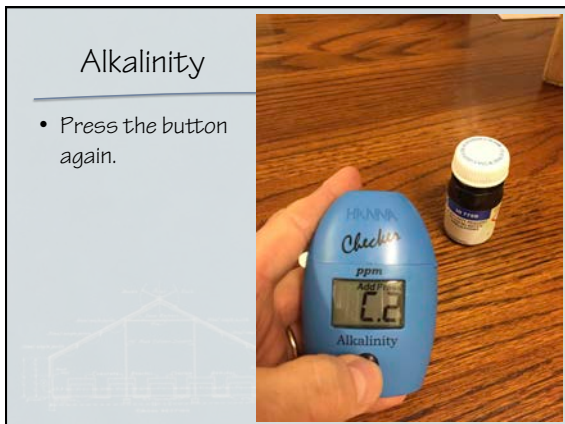
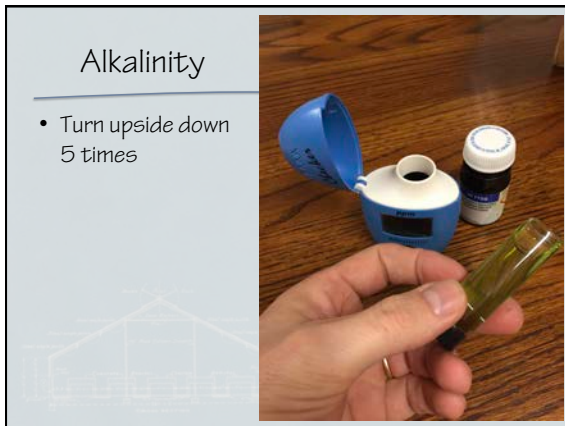
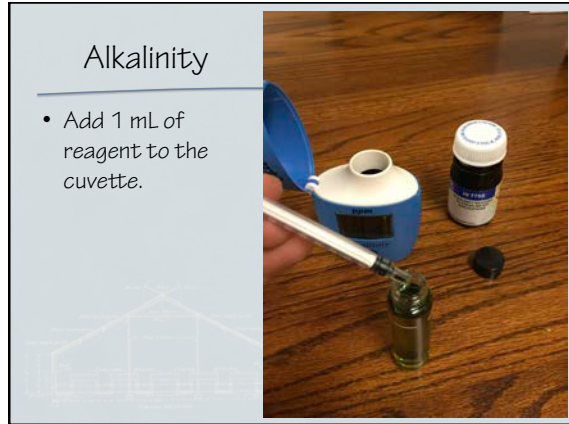
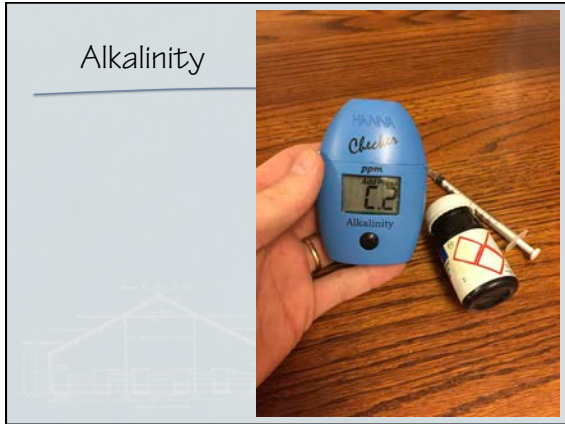
### Monitoring the Fertility Triangle

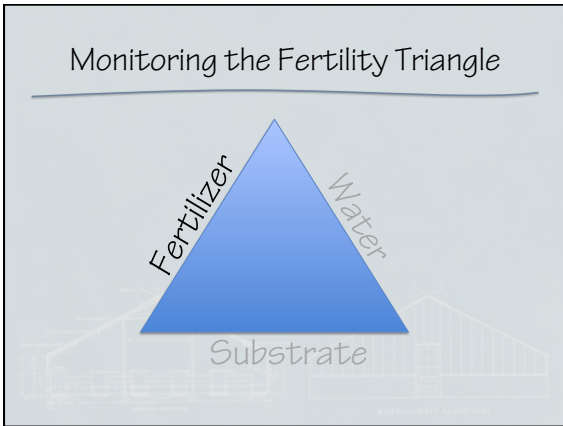




- ### Water
- Alkalinity
    - Why do we care?
  - Testing
    - Send to a lab ~\$40
    - In-house test
      - Hanna 3811 - \$40
      - Hanna 775 - \$50








### Fertilizer Selection

- Are we only concerned about N-P-K?

### Fertilizer Injector

- Calibration



### Fertilizer Injector

Feed Rate Nitrogen	EC (mmhos)	1:15 Ounces/Gallon of Concentrate	1:100	1:200
50 PPM	.37	.65	4.50	9.00
100 PPM	.74	1.35	9.00	18.00
200 PPM	1.48	2.70	18.00	36.00


Limit of Solubility 4.5 lb. per Gallon      Multiply by 7.5 to convert to Grams/Liter  
 1 teaspoon/gallon = 188 PPM N      1 Tablespoon/gallon = 564 PPM N

### Fertilizer Injector

- How to Calibrate
- Measure the EC of your clear water
- Measure the EC of your fertilizer water
- Consult the label

### Fertilizer Injector

- Water EC = 0.23
- Fertilizer EC = 1.00



### Fertilizer Injector

Feed Rate Nitrogen	EC (mmhos)	1:15	1:100	1:200
50 PPM	.37	.65	4.50	9.00
100 PPM	.74	1.35	9.00	18.00
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Multiply by 7.5 to convert to Grams/Liter

### Fertilizer Injector

- Water EC = 0.23
- Fertilizer EC = 1.00

$1.00 - 0.23 =$

0.77



### Fertilizer Injector

Feed Rate Nitrogen	EC (mmhos)	1:15	1:100	1:200
50 PPM	.37	.65	4.50	9.00
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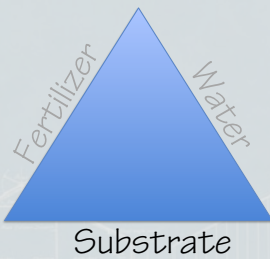
Limit of Solubility 4.5 lb. per Gallon  
 1 teaspoon/gallon = 188 PPM N    1 Tablespoon/gallon = 564 PPM N

Multiply by 7.5 to convert to Grams/Liter

### Watch the Video

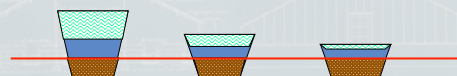
[www.nhfloriculture.com](http://www.nhfloriculture.com)

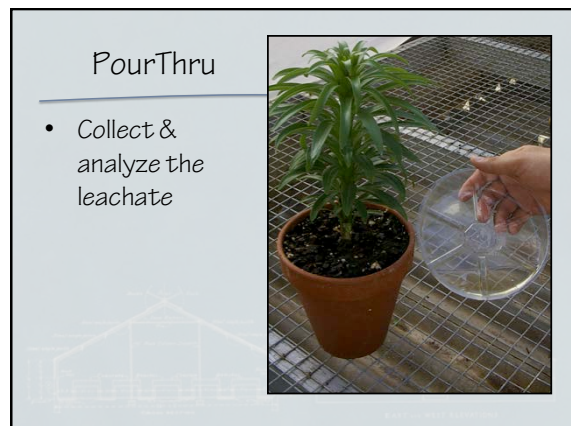
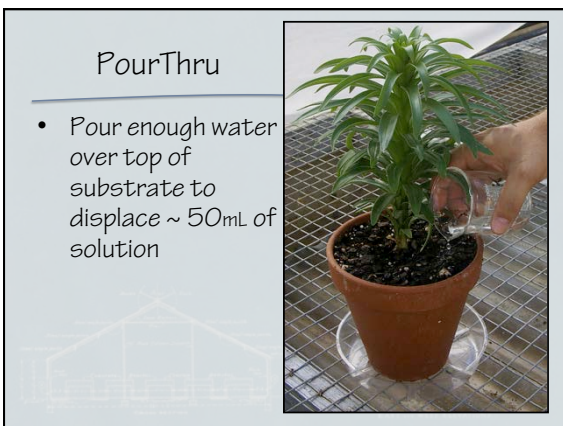
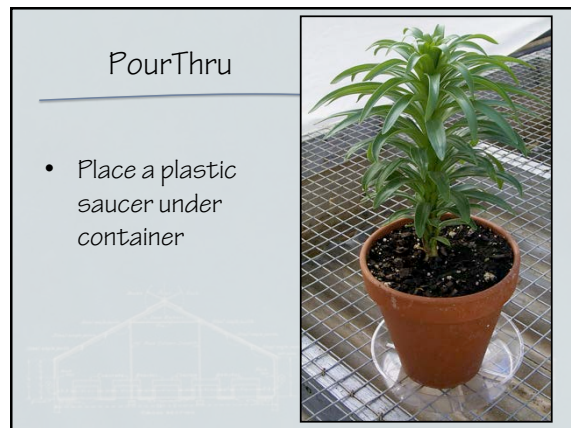
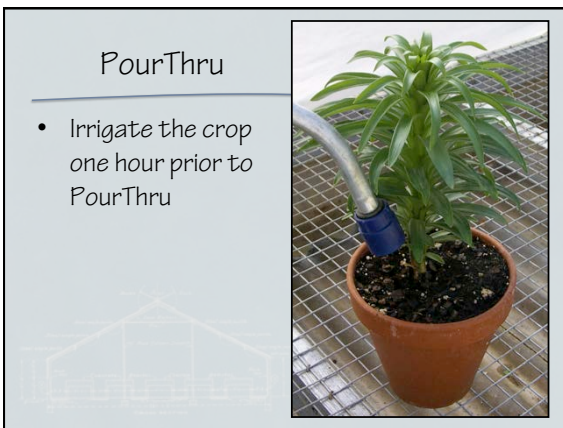
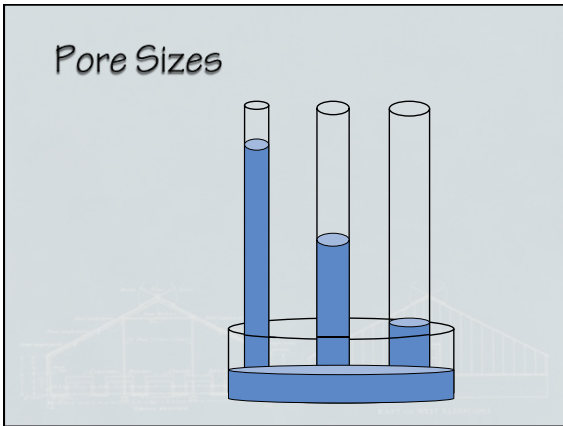
### Monitoring the Fertility Triangle



### Container Size

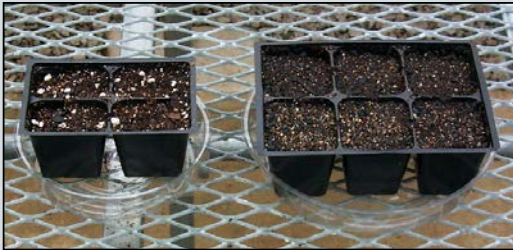
- The taller the container:
  - the more drainage
  - the more air space
  - the less water retention
- The larger the container:
  - the more water reserve
  - the less watering frequency





### PourThru

6 or 8-inch saucers



### Distilled Water Volumes

Pot Size (inches & cm)	ml	oz
Cell Pack	30	1.0
4" (10 cm)	30	1.0
5" to 6" (12 to 15 cm)	75	2.5
6.5"+ (16 cm+)	100	3.4

### Bottom Line

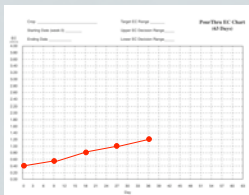
Use enough to get:

- 30 ml (1.0 oz) from a cell pack
- 50 ml (~ 2 oz) from a 6" (15 cm) pot
- 50-60 ml (~ 2-3 oz) from a 6.5" (16 cm) or > pot

### How Many Samples?

5 pots / cell packs

### Record It!



Sampling Form						
Craps	Samples	ml added	ml out	pH	EC	Comments
Date:	1					
Location:	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
		Average				


### Let's Talk Meters First



### Let's Talk Meters First

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- Hanna
  - 9813 - \$180
  - 98130 - 130
- Spectrum
  - EC - \$395
  - pH - \$310
  - Dual - \$260



### Watch the Video


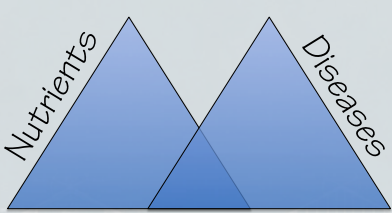
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[www.nhfloriculture.com](http://www.nhfloriculture.com)



### We Do Not Live in a Vacuum

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 University of New Hampshire  
Cooperative Extension

### Questions?

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