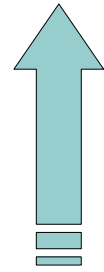


Fertility Management

Depends upon the growing system choose

- Ground/Soil
- Soiless Media
- Hydroponics

Management Intensity



Hydroponics

Soiless Media

Soil

Show of Hands

- Growing directly in soil in high tunnel?



Soil Fertility Management in High Tunnels

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High Tunnel Location

- Good ground
- Not prone to flooding
- Few persistent weed issues

Site Selection

- Most profitable ground on the farm?

Site Selection

- You wouldn't swimming pool in your living room
- You shouldn't locate your high tunnel on poor ground

Water Source Quality

- Well Water
- Municipal Water
- Surface Water

Well Water

- High in alkalinity (pH)
- Clog drip lines



Municipal Water

- Treated water ("city water")
- May contain fluoride



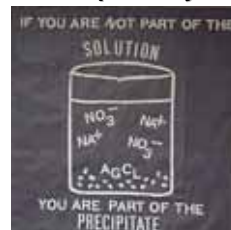
Surface Water

- Silt
- Particulates
- Disease Organisms



Drip Fertigation

- Fertilizer Incompatibility



Soil Test

Basis for Any Applications

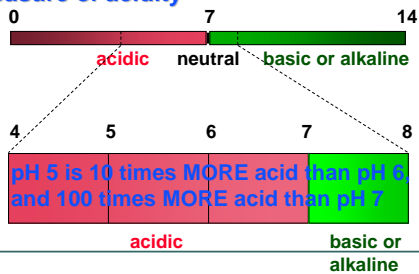
- Nutrient Status of Soil
- pH
- Organic Matter

Nutrient Status of Soil

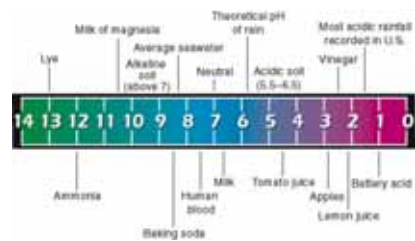
- Usually reported in a High, Medium, Low basis
- Likelihood of seeing a response

pH

Measure of acidity

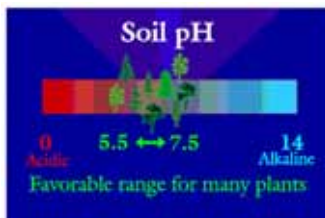


pH

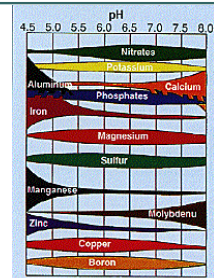


pH

- Acidity and Alkalinity of Soil



pH and Nutrient Availability



Organic Matter



Adjusting Nutrients - Preplant

- pH
- Organic Matter – Cover Crops, green manures, compost
- Preplant N-P-K Application

Adjusting Nutrients - Post Plant

- Drip Injection



Foliar Fertility

- Not Recommended
 - Wet foliage
 - Inadequate Uptake



Tissue Testing

- Sample Method Varies by Crop
- Not compatible with Foliar Feeding
- Tomato Example

Tomato Tissue Sampling

- Time of Day – Temperature and Time of day influence reading – be consistent
- Leaf Age – Most Recently Matured Leaf – Fully Expanded
- Whole leaf petiole, leaflets stripped off
- Number of Leaves - ~20 for 5-10 acre field

Adapted from G. Hochmuth, Plant Petiole Sap-Testing for Vegetable Crops, FL Coop. Ext. Serv. Circ. 1144 (1994).

Test Kits – Cardy Meters

- Separate meters for N and K
- Sap expressed on to electrode
- Proper calibration required
- Store meters properly

Adapted from G. Hochmuth, Plant Petiole Sap-Testing for Vegetable Crops, FL Coop. Ext. Serv. Circ. 1144 (1994).

Testing Guidelines – Petiole

Fresh Petiole Sap Concentration (ppm)		
Stage/Timing	NO ₃ -N	K
First Bud	1000-1200	3500-4000
First open flowers	600-800	3500-4000
Fruits 1-inch	400-600	3000-3500
Fruits 2-inch	400-600	3000-3500
First harvest	300-400	2500-3000
Second harvest	200-400	2000-2500

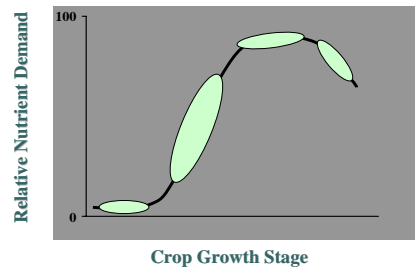
Adapted from G. Hochmuth, Plant Petiole Sap-Testing for Vegetable Crops, FL Coop. Ext. Serv. Circ. 1144 (1994).

Testing Guidelines – Whole Leaf

	%					ppm										
	N	P	K	Ca	Mg	S	Fe	Mn	Zn	B	Cu	Mo				
First Bud	3.0-5.0	0.3-0.6	3.0-5.0	1.0-2.0	0.3-0.5	0.3-0.8	40-100	30-100	25-40	20-40	5-15	0.2-0.6				
First open flowers	2.8-4.0	0.2-0.4	2.5-4.0	1.0-2.0	0.3-0.5	0.3-0.8	40-100	30-100	25-40	20-40	5-15	0.2-0.6				
Fruits 1-inch	2.5-4.0	0.2-0.4	2.5-4.0	1.0-2.0	0.3-0.5	0.3-0.6	40-100	30-100	20-40	20-40	5-10	0.2-0.6				
First harvest	2.0-3.5	0.2-0.4	2.0-4.0	1.0-2.0	0.3-0.5	0.3-0.6	40-100	30-100	20-40	20-40	5-10	0.2-0.6				

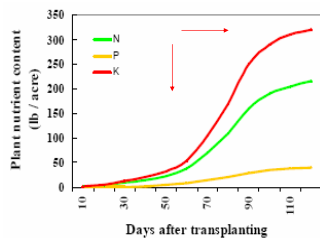
Adapted from G. Hochmuth, D. Maynard, C. Vavrina, and E. Hanon, Plant Tissue Analysis and Interpretation for Vegetable Crops in Florida, FL Coop. Ext. Serv. Special Series SSV/EC-42, 1991.

Nutrient Demands Change



Feed the Plant When it needs it

Target K application to flowering stage



Compost

- Compost mineralization
- Compost quality
- Compost vs. Aged
- Compost problems – herbicide and source

Ideas for the Future?
