

# Commercial Aeroponic Farming of Baby Leafy Greens



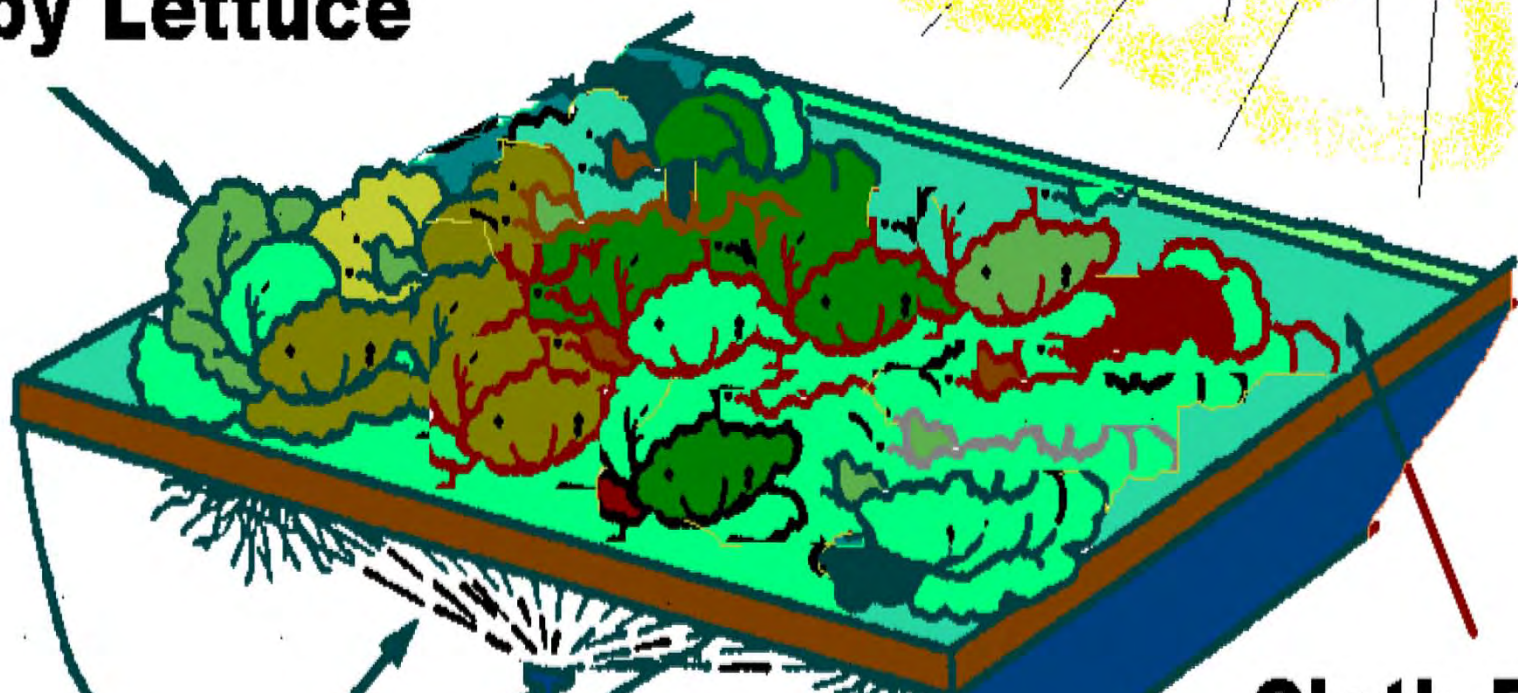
# Content

- Process
- Learning -> Design Changes
  - Chamber
  - Cloth
  - Light
  - Nutrient solution
- Commercial operation



**HPS Light**

**Baby Lettuce**

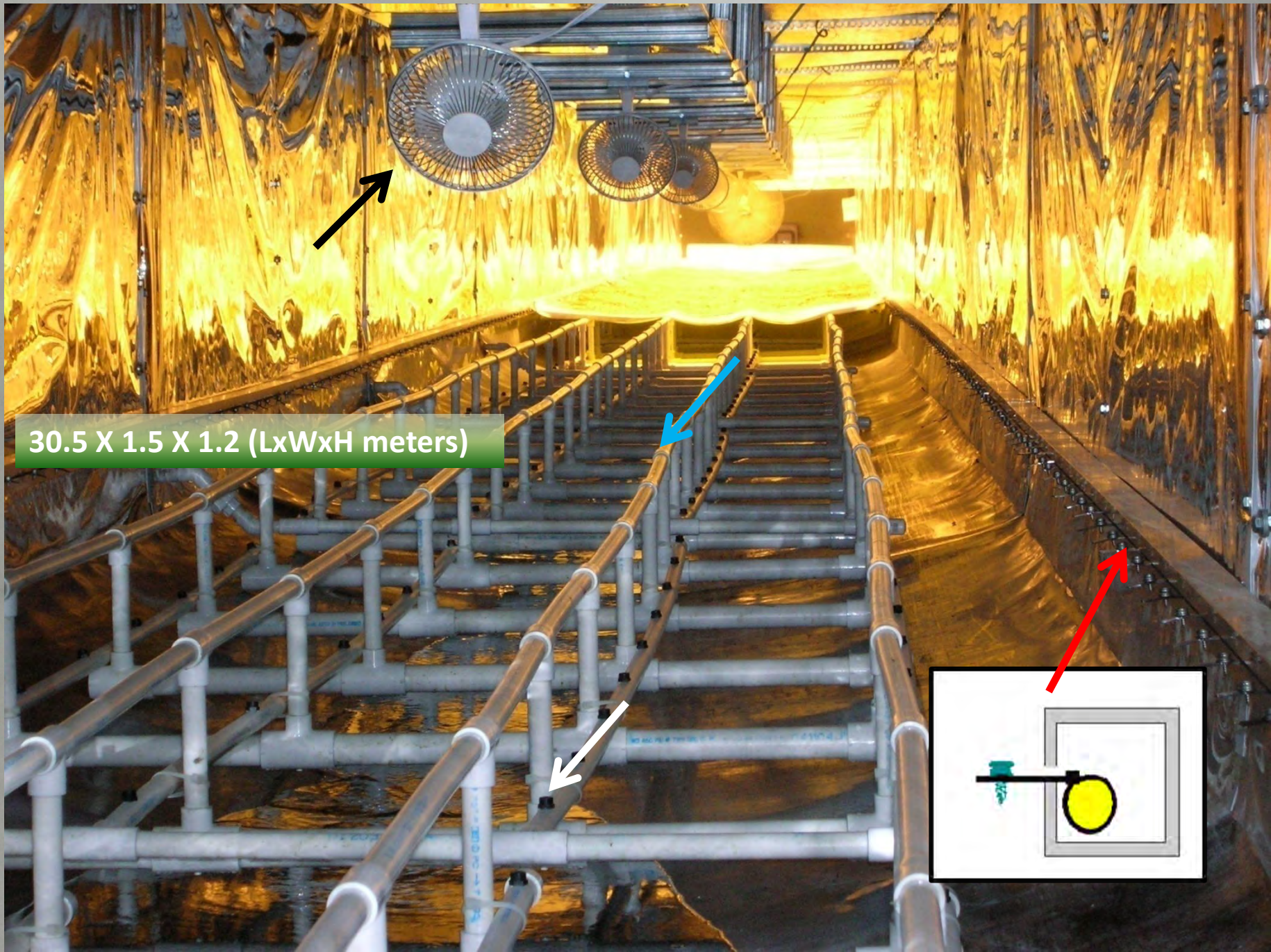


**Cloth Fabric**

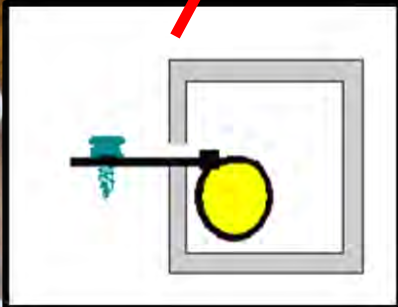
**Nutrient Spray**

**Solution Chamber**





30.5 X 1.5 X 1.2 (LxWxH meters)







# Design Changes: Chamber

- FRP coated w/Mylar to white Tekfoil
  - Reduce weight & white reflects better than Mylar
- 32 mil HDMW to 6 mil Polypropylene
  - Reduce weight & ease installation
- Series of turbulence fans to single fan
- Chamber oriented to room oriented A/C
  - Less expensive & more effective delivery of conditioned air

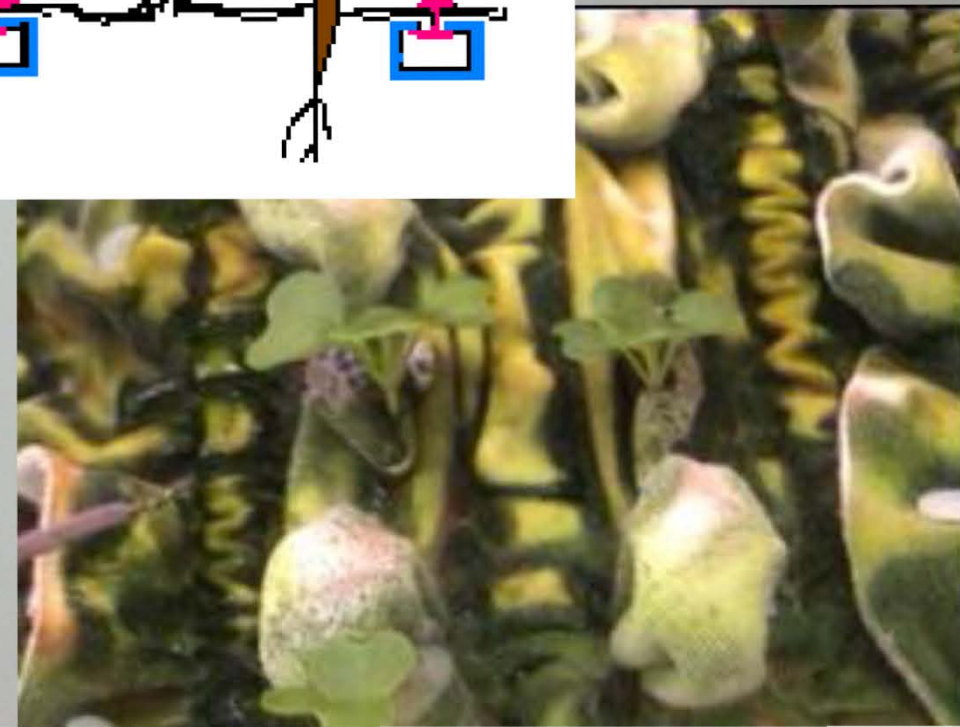
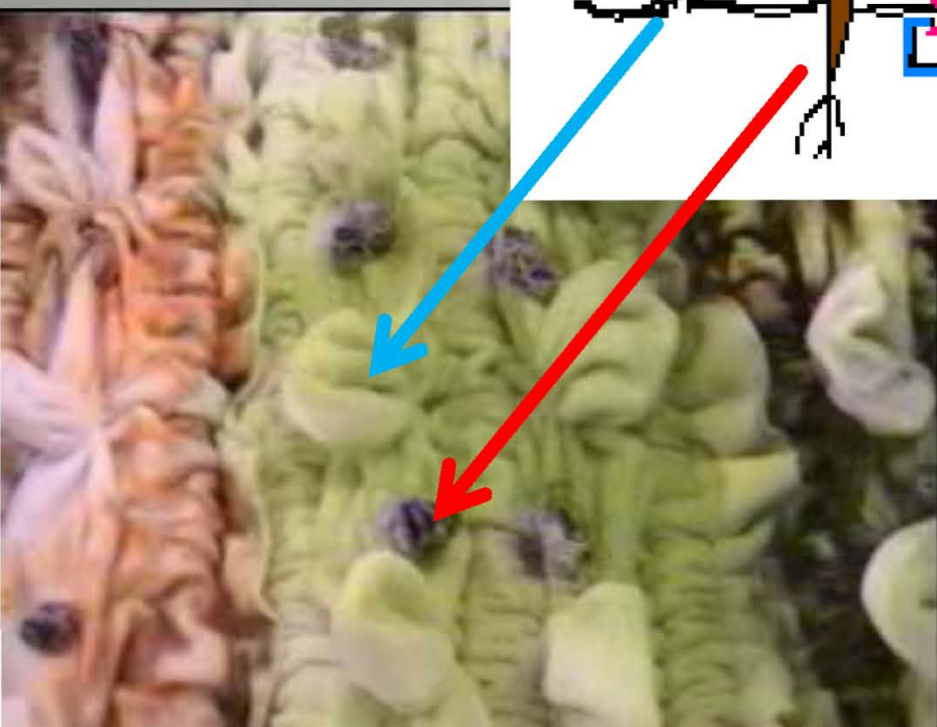
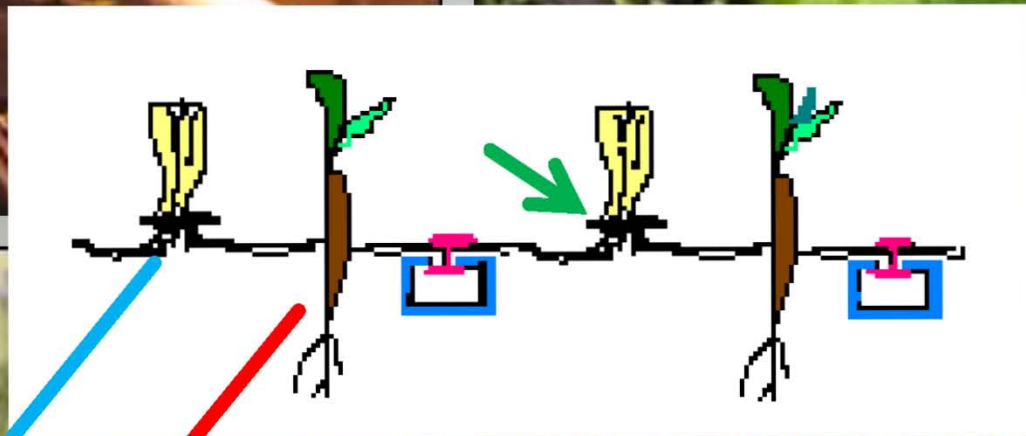


# Design Changes: Cloth

1. Began w/ holes with cloth tubes holding seed  
Best for growing heads
2. Next, furrows with vacuum seeder
3. Final - cloth covered briefly after sprinkling salad













# Design Changes: Light

- Comparing High Pressure Sodium (HPS) & Metal Halide (MH) – 400 watt bulbs
- 24/24 lighting ( $\sim 14 \text{ moles}\cdot\text{day}^{-1}$  PPF)
- $6 \text{ sec}\cdot\text{min}^{-1}$  nutrient spray
- Data weighted for days grown, ranging from 21 to 35 days
- $\text{CO}_2$  ranged from 90 to  $340 \mu\text{moles}\cdot\text{mole}^{-1}$
- Furrowed flats & vacuum seeder



# Design Changes: Light (cont.)

	Arugula	Fennel Mix*
<b>MH mean (g)</b>	340	409
<b>HPS mean (g)</b>	340	<b>440</b>
<b>N (paired flats)</b>	43	19
<b>t-Ratio</b>	0.479	0.139

\*Fennel Mix = (rows) of fennel (1), kohlrabi (8), kale (5), and water cress(1)

Additional advantages: HPS is cooler, lasts longer, costs less, and is more durable



# Design Changes: Nutrient Solution

## Prevent bio-film in plumbing

- Constant spray
- Increase flow rate
- Maintain pH under 5.8
- Maintain solution temperature under 20 C



# Commercial Results/Projections

- Sold > 900 Kg to restaurants and grocers
  - Average price: \$15.18·kg<sup>-1</sup>
  - Yield: 0.3 kg·m<sup>-2</sup>·yr<sup>-1</sup>
- 

## Full size:

- Gross margin 52% and net margin of 14%
- Investment of \$460K w/o bldg.
- 1,950 m<sup>2</sup> with 1,850 m<sup>2</sup> of growing space - more if stacked more than 2 high



**LED**  
THANK YOU!

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