A top issue: Quality

Good Quality in Street Market
Sao Paulo, Brazil
**Keys to a healthy Farm**

- Crop rotations
- Cover Crops, green manures
- Composts & organic mulches
- Crop diversity, multiple crops
- The Goals: Biological control and improved nutrient cycles

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**Know your soil**

**How to increase and improve soil organic matter?**

- Organic Amendment applications
- Cover Crops
- Minimum-tillage
- Rotations (with non-solanaceous crops)

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**Soil Compaction limits root growth**
Vegetable Fertilizing tips

1) Soil/tissue testing
2) Tune-up applications to local conditions (based on crop uptake)
3) Apply proper rates
4) Proper soil moisture

Tomato Tissue Levels (aim target levels based on historical data from your farm)

N = 3-4.5%
P = 0.4-1%
K = 3-7%
Ca = 2-5%
Mg = 0.4-1.5%

Eggplant Tissue Levels

N = 4-5%
P = 0.4-1%
K = 3-5%
Ca = 0.8-1.5%
Mg = 0.25-0.6%
### Adequate Soil Nutrient Levels

- **P**: 35-50 ppm  
  >300 for veggies?  
- **K**: 200-300  
- **Ca**: 1500-2000

### Water use in Squash (60 days) and Tomato (14 weeks)

**Water use in Squash (60 days)**

<table>
<thead>
<tr>
<th>Day</th>
<th>Water Use (mL/day)</th>
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<tbody>
<tr>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>3</td>
<td>0.6</td>
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<tr>
<td>4</td>
<td>0.8</td>
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<td>5</td>
<td>1.0</td>
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<td>6</td>
<td>1.2</td>
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<tr>
<td>7</td>
<td>1.4</td>
</tr>
<tr>
<td>8</td>
<td>1.6</td>
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</tbody>
</table>

**Water Use in Tomato (14 weeks)**

![Water use in Tomato graph](image_url)
Frequency and depth of application:

- Determined by weather and soil conditions, crop development stage, and depth of the root zone

Hi-Flo T-Tape with 8 inch emitter spacing, 0.67 gpm/100ft.

Irrigate 3x/week.

Irrigation schedule according to previous week’s Evapotranspiration

Maui Peppers Profile

Optimum soil pH

- Tomato- 6-6.5
- If pH below 5.8 apply 2000 lb/Acre ag lime (4.5 lb 100 sq ft)

Liming Acid Soils

- Lowers Al and Mn toxicity
- Increased Microbial Activity
- Prevents Ca and Mg Deficiencies
- Increased symbiotic Nitrogen fixation
- Increased Phosphorus/Molybdenum
Calcium deficiency can result from:

- Excessive soluble salts in the soil solution (such as from potassium, sodium, ammonium fertilizers)
- Excessive Nitrogen
- Uneven watering, growth

Manure applications

- 20,000 lb/Acre
- 300 lb/100 ft
- 1 lb/hill chicken manure

Chemical Fertilizers
Typical Application Rates

- 1,500-2,000 lbs 10-20-20
- 1,500-2,000 lbs 16-16-16

= 20-30 lbs/100 ft row
(7,161 ft row per acre)

If soil analysis shows high P and K

Then add fertilizers with no P and K, such as Ammonium Sulfate, or Calcium Nitrate
Nitrogen Fertilizers

- Ammonium Sulfate 21% N
- Ammonium Nitrate 82.5% N
- Calcium Nitrate 15% N
- Potassium Nitrate 13% N
- Urea 46% N

Timing of Applications

- 50% at planting
  50% 4 weeks later

- 50% at planting
  25% 4-weeks later
  25% 4-6 weeks later

Tomato Fertility

- 1,500-2000 lb/acre 10-20-20 (ca 30 lb/100 ft)
- 100 lb/Acre Urea 3-4 weeks after 1st harvest (ca 1.5 lb/100 ft row)

Vegetable Nutrition has a direct effect on:

1) Pest Control
2) Marketing/Profits
3) Environmental Impacts
Field preparation for **drainage**, seedling establishment

Field preparation with small implement: rototiller

Bed preparation important for crop establishment

Bed preparation important for crop establishment
Stand Establishment

To obtain good stands in the field it's critical to start with healthy seedlings.

Kula cabbage seedling, nursery

Commercial Seedling house, Florida
Starter Fertilizers

- For transplants, seedlings
- 8-24-8; 15-30-40
- use 3 pounds in 50 gallons of water
Raised beds for improved drainage
Cuttings, seedlings, or seeds should be free of insects, nematodes, and diseases.

Floating Cover
Physical barrier to protect soybeans from birds.
Trellis system for eggplant

Trellis system for bell pepper
Eggplant Staked with plastic mulch
Trellis for tomatoes

Greenhouses/rain shelters, Big Island
Rain-shelter for high-value vegetable production

Floating Cover Zucchini in Waianae, living mulch experiment

Intercropping/diversity between planting beds
Organic Mulches, weed control, water conservation, Cooler soil temperatures, less erosion

Disease Mgmt strategies

- resistant cultivars
- crop selection & balanced nutrition
- remove weeds
- control vectors (aphids)
- clean equipment between fields
- rotations/promote microbial activity

Bonica Tech

Glory
**2006 Cultivar Trials**

Jason Cooksey, Western Pacific Seed  
Jcooksey@westernpacificseed.com  
t. 951-735-7289

WPX-152  
(Pacific Seed)

HMX-152  
(Pacific Seed, Harris Moran)

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**2007 Cultivar Trials**

Jeff Sais, Seminis Seed  
Jeff.sais@seminis.com  
t. 805-934-8436

Roma types: Veloz, PS-0151-2642  
Round type: EX-0149-8426
Pests, thrips damage

Pests, mites damage

Diseases, TSWV

Diseases, Phomopsis

Nematode damage

Wind damage
Factors that reduce quality

- Harvest at incorrect maturity
- Careless Handling
- Lack of Sanitation
- Delays in pre-cooling

Mechanical Injury

- Bruises
- Cuts
- Punctures
- Abrasions