Manual of Tomato and Eggplant Field Production

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A top issue: Quality

Good Quality in Street Market Sao Paulo, Brazil

Keys to a healthy Farm

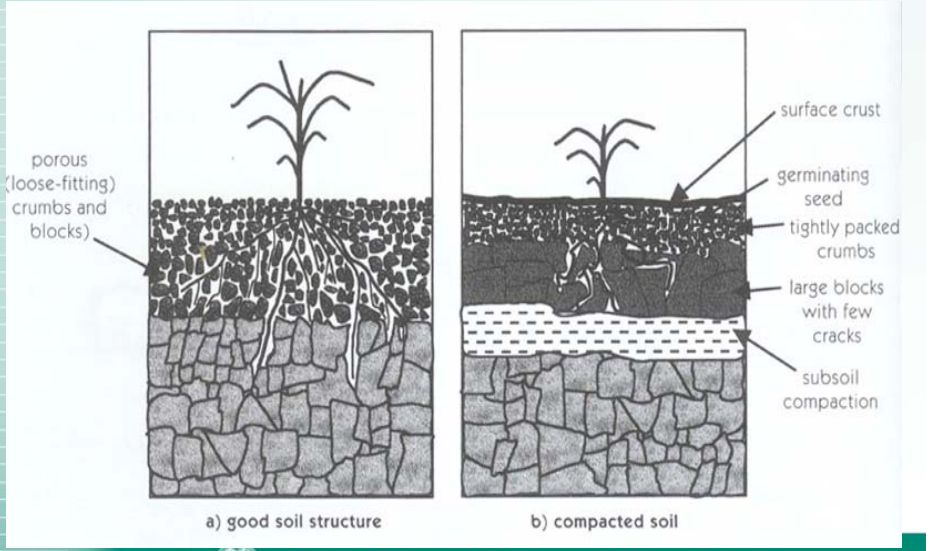
- Crop rotations
- Cover Crops, green manures
- Composts & organic mulches
- Crop diversity, multiple crops
- The Goals: Biological control and improved nutrient cycles

Know your soil

How to increase and improve soil organic matter?

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

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

G. Donald Sherman Laboratory, Room 134
Honolulu, Hawaii 96822

PLANT TISSUE ANALYSES WORKSHEET

RECEIVED: 12/13/06	SAMPLE TYPE		CAT/CC
COMPLETED: 12/19	[ ] PLANT TISSUE	REASON:	
Aloun Farms	CROP:	PROBLEM [ ]	COLLECTED:
	VARIETY:	MONITOR [ ]	COMPLETED:
	AGE:	SURVEY [ ]	COLLECTOR:
	TISSUE:	EXP. [ ]	SITE:
TOTAL SAMPLE: 3		OTHER:	
	SOIL SUBMITTED: [ ] YES [ ] NO		

Description	Anal. Code	% N	P	K	Ca	Mg	Na	S	ug/ Fe	Mn	Zn	Cu	B	Mo
pepper 3 wks old	T1,2	5.30	0.44	6.18	1.52	0.99	0.16		110	284	71	59	50	
pepper 1 wks old		4.42	0.41	4.27	0.76	0.64	0.18		80	99	35	1	46	
tomato 3 wks old		5.04	0.40	3.50	2.84	1.11	0.17		296	104	21	13	38	

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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%

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Eggplant Tissue Levels

N= 4-5%
P= 0.4-1%
K= 3-5%
Ca= 0.8-1.5%
Mg= 0.25-0.6%

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Sample Information

Job Control No:	05-035142-002	Map Unit:		Plant Grown:	OTHER CROP
Sample Label:	FERT	Soil Series:		Plant to be grown:	OTHER CROP
Date Received:	4/5/1905	Soil Category:	HEAVY SOIL	Can you till 4~6 in.?	No
Send Copy To		Soil Depth (in):		Test Results Only?	No
Elevation (ft.):		Latitude:		Longitude:	

Test Results and Interpretation

HEAVY SOIL

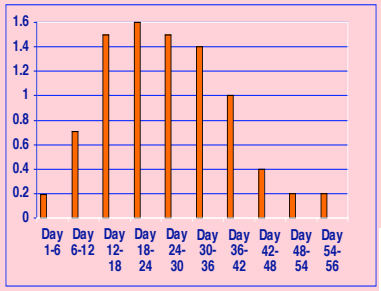
Soil Analysis	Results	Expected	INTERPRETATION
_pH	6.1	6	
P_ppm	1005	37.5	
K_ppm	520	250	
Ca_ppm	1616	1750	
Mg_ppm	186	350	
OC_%	1.54	No criteria found	
Total_N_%		No criteria found	
Salinity_EC	0.12	1.25	
S_ppm		No criteria found	
Fe_ppm		No criteria found	
Mn_ppm		No criteria found	
Zn_ppm		No criteria found	
Cu_ppm		No criteria found	
B_ppm		No criteria found	
Mo_ppm		No criteria found	
Al_ppm		No criteria found	

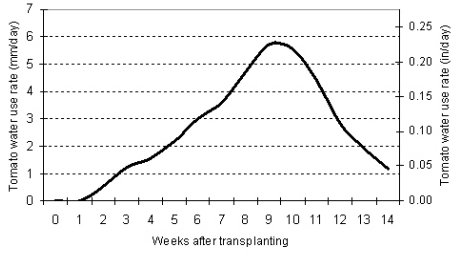
Very Low | Low | Sufficient | High | Very High

Adequate Soil Nutrient Levels

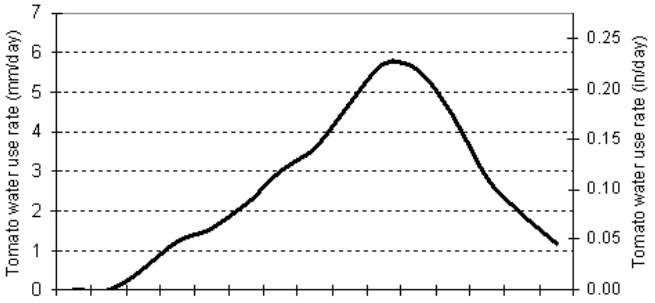
- P= 35-50 ppm
  >300 for veggies?
- K= 200-300
- Ca= 1500-2000

Water use in Squash (60 days) and tomato (14 weeks)





Water use in Tomato (14 weeks)



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Frequency and depth of application-

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

Maui Peppers Profile

- Hi-Flo T-Tape with 8 inch emitter spacing, 0.67 gpm/ 100ft.
- Irrigate-3x/ week.
- Irrigation schedule according to previous week's Evapotranspiration

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

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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)

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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 its critical to Start with healthy seedlings.

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

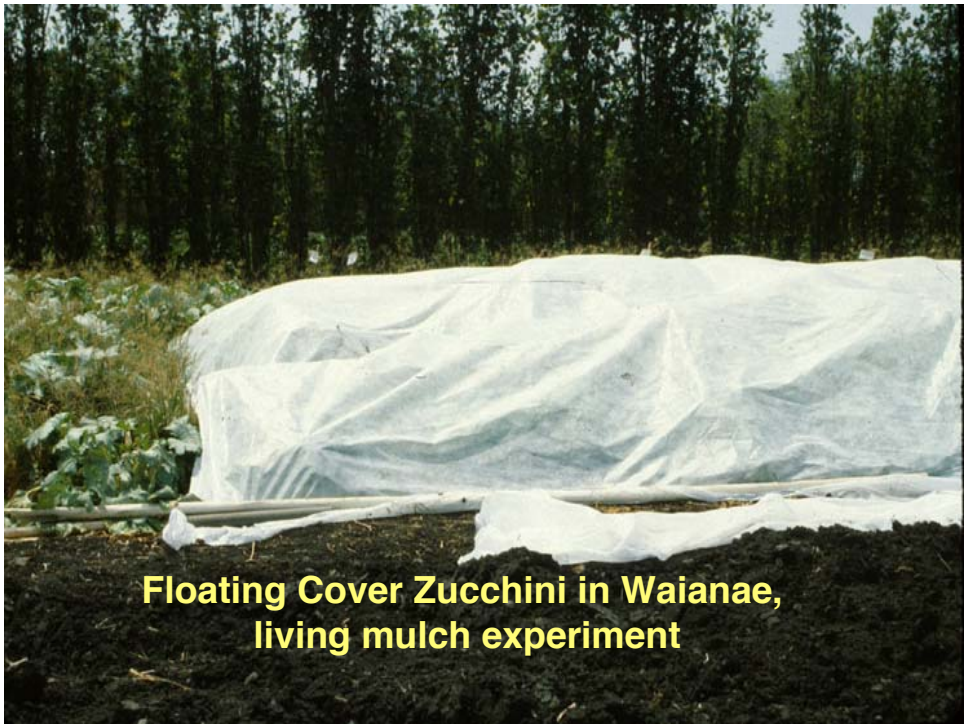
Trellis system for bell pepper

Eggplant Staked with plastic mulch

Trellis for tomatoes

Greenhouses/rain shelters, Big Island

Rain-shelter for high-value vegetable production



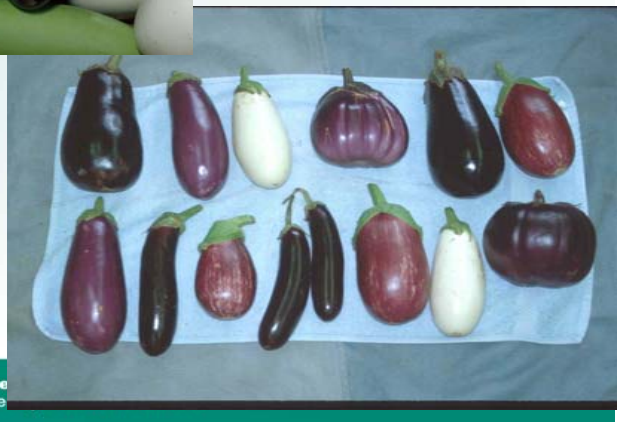
Floating Cover Zucchini in Waianae, living mulch experiment

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

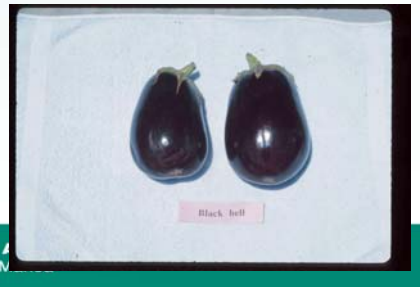


Bonica Tech

Glory

Tasca

Black Bell



2006 Cultivar Trials

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

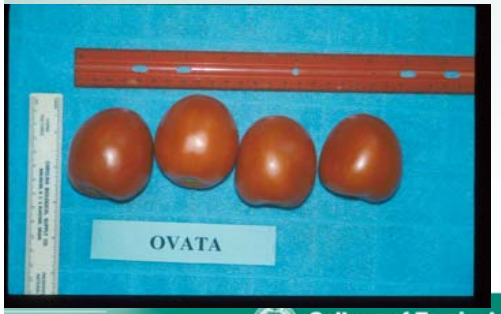
WPX-152
(Pacific Seed)

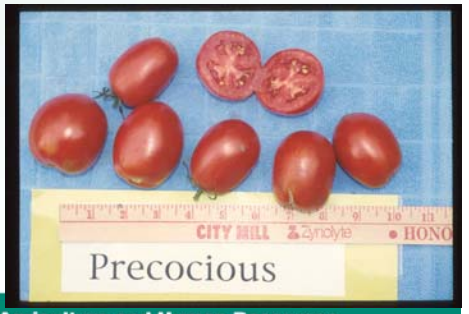
HMX-152
(Pacific Seed, Harris Moran)

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