Measuring Cantaloupe Growth from Emergence to Harvest

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Cantaloupe (melon) Production - Arizona

- Spring melons
  - ~ 10,000 acres
  - Yield ~ 230 cwt./acre
- Fall melons
  - ~ 4,000 to 5,000 acres
  - Yield ~ 214 cwt./acre

Crop System Efficiency

- Provide inputs that you need
  - must consider positive crop response
- Timing is critical
- Must follow crop condition
  - requires crop monitoring

Critical Limiting Factors in Desert Agriculture

- Water (Irrigation management)
- Nitrogen
- Pest Control / Management

Crop Management – Strategies

- Scheduled Approach
  - Based on calendar dates or days after planting (DAP)
- Feedback Approach
  - Based on crop condition
  - Stage of growth

Feedback Management Requirements

- useable / accessible measurement
- established baselines / guidelines
  - reference base
- common variety types (species)
- regionally specific baselines
- validation of recommendations
Dynamic Nature of the Melon Plant

- Due to its indeterminate nature, melon plants are very sensitive/responsive to environmental conditions
- Plant will retain or abort fruit in response to current conditions
- Melon plants are sensitive or responsive to management
- Managing veg./repro. balance critical

Melon Plant Growth / Mgt.

- Allocation of nutrients and resources to vegetative/reproductive components
  - in response to environmental conditions
- Represents a major challenge in melon production
  - Irrigation
  - Fertilization
  - Pest management/control
  - Vigor/disease management

Vegetative / Reproductive Balance

- What is normal?
- How do you measure it?
- What do you do about it?

Crop Monitoring - Objectives

- Predict important stages of growth
- Yield Projections

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Development of Baselines for Reference – Arizona conditions

Development of a representative database (regionally specific)
- Regular sampling of plant growth and development data

Silvertouch, Jeffrey C. 06/04/03. The 9th Annual Melon Field Day, Maricopa Agricultural Center, Maricopa, AZ.
Development of Baselines for Reference – Arizona conditions

- Plant measurements on 14 d intervals
- Node numbers
- Vine length
- Female blooms
- Melon number
  - (> golf ball sized melons / 3-4 cm dia.)
  - Primary and all fruiting vines
    - Usually up to 5 fruiting vines

Vine Measurements
Silvertooth, Jeffrey C. 06/04/03. The 9th Annual Melon Field Day, Maricopa Agricultural Center, Maricopa, AZ.
2003 melon mainstem development
(length - cm) as a function of heat

- Development of crop monitoring system
  - based on melon phenology models
  - heat unit (HU, 86/55 °F thresholds) basis
- Development of feedback management systems
  - mgt. based on crop condition
  - nutrients, water, insect pests, PGRs, etc.

Melon Agronomy Program
Crop Monitoring - Crop Management

- Stage of growth (HU model)
- Crop vigor estimate
  - Vegetative growth index
- Fruit load development (melon prod.)
  - Ex. high fruit load = high N demand
- Yield projection

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