



Vegetable: Soil water management

Soil Management

Soil Structure, Soil Texture, Soil Type, Tilth

Why important?

- a. Seeding, Plant Establishment
- b. Root growth/penetration, aeration
- c. Water infiltration and movement
- d. Root, tuber and bulb crops – Quality and shape of crop



Key management Practices

- a. Site selection
- b. Tillage of correct type and correct soil moisture level
- c. Crop rotation
- d. Cover crop and/or mulch

Soil Fertility and Plant Nutrition

Soil Testing – provides knowledge of soil levels at start of cropping season and allows adjustment of fertilizer according to needs.

1. Nitrogen
2. Phosphorus
3. Potassium
4. pH
5. Micronutrients – zinc, iron, copper, manganese, sulfur, etc.
6. Toxicities or imbalances

Plant Tissue Analyses – provides current nutritional status during growing season; most useful for adjusting fertilization of future crops

Management Practices

- a. Soil Test
- b. Apply fertilize according to specific crop needs
- c. Crop rotation – e.g. alternate deep and shallow rooted crops
- d. Proper irrigation management

Water Management

Why important?

1. Crop Yield
2. Crop Quality
3. Disease Management



Management Practices

Pre-Irrigation leads to

- a. Better crop establishment
- b. Better weed management strategy
- c. Water may be more available during off-season
- d. Less irrigation during crop season

Prepared by Ron Voss and Mark Bell. April 8, 2008

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Water Management (continued)

Frequency and Amount of Irrigation

- Warm season vegetables – usually deeper rooted, thus infrequent irrigation with higher amounts of water.
- Cooler season vegetables – usually shallow rooted, thus more frequent irrigation with lower amounts of water
- Growth stage important

Method of Irrigation – criteria for choosing

- custom/knowledge,
- efficiency,
- infiltration rate into soil / aeration,
- capital available,
- value of crop



Types of Irrigation – Advantages, Disadvantages

Border

Advantages	Inexpensive, Least technology
Disadvantages	High irrigation rates, Low water infiltration and soil aeration

Furrow

Advantages	Inexpensive, Relatively low capital and technology, potentially lower weed control costs
Disadvantages	Inefficient, Requires leveling of soil, salt accumulation

Sprinkler

Advantages	leaching of salts, uniform application, higher efficiency, application of fertilizer
Disadvantages	Capital investment cost, foliar disease, technological knowledge, higher weed population

Drip

Advantages	Most efficient, application of fertilizer, lower foliar disease and weed incidence, uniform application
Disadvantages	High initial cost, higher technological knowledge

Monitoring or Measuring Irrigation Needs

- Monitor soil moisture – e.g. tensiometers
- Measure or estimate crop water use – e.g. ET (evapo-transpiration)
- Combination of soil-moisture and water-budget based scheduling approaches

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