Vegetarian 85-6  
June 17, 1985

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Note:

Anyone is free to use the information in this newsletter. Whenever possible, please give credit to the authors.

The use of trade names in this publication is solely for the purpose of providing information and does not necessarily constitute a recommendation of the product.
I. NOTES OF INTEREST

A. Vegetable Crops Calendar

June 24 - 28, 1985. 4-H Horticulture Institute, Camp Cloverleaf, Sebring.

July 29 - August 1, 1985. 4-H Congress, Gainesville (Horticulture Contests on July 30; Horticulture Workshop on August 1).


September 5 - 7, 1985. Tenth Annual Joint Tomato Conference. Marriott's Marco Beach Resort, Marco Island. Tomato Institute will be held on September 5.

II. COMMERCIAL VEGETABLES

A. Drip Irrigation Update

The major objective of irrigation is to supply plants with sufficient water to prevent periods of stress that may result in reduced yields or quality. The major irrigation types currently used in vegetable production are seep irrigation and overhead irrigation. Drip irrigation is gaining in use for several commodities state wide and is used extensively in vegetables in two locations. Specific information gaps have been pointed out for the use of drip irrigation in several parts of the state. In several instances research is available to answer the perceived gaps, but unfortunately, in other instances, more research is needed.

To establish statewide drip irrigation cultural recommendations and identify research needs, a group of researchers from Gainesville and several agricultural research centers met with state and county extension faculty at the Gulf Coast Research and Education Center in Bradenton in May. The following points were discussed and should be added to future educational programs for growers interested in drip production.

Field Preparation

Good soil moisture must be established in the field for fumigation. This may have to be done with overhead or seep irrigation. Rainfall is not always timely or adequate.

Drip irrigation should be used before seeding or transplanting to maintain soil moisture levels. Rewetting dry soil by any irrigation method is many times very difficult.

Plant Establishment

In some soils during very dry or windy conditions, water in addition to drip irrigation may be needed for plant establishment.
This may be done by water wagons, overhead or seep irrigation.

**Soil-Water Relations**

When drip irrigation is used, a percentage of soil moisture must be maintained either culturally or through other irrigation sources.

Where threat of flooding is not a severe problem, the bed height should be lowered. High beds will dry out much faster than lower beds. Lateral wetting patterns are much wider when a degree of soil moisture is maintained across the entire bed area.

In areas where beds must be high due to historical flooding conditions, water should be maintained in the seep furrows to supply this needed bed moisture. The height of the perched water table may be lowered considerably from what must be maintained for total irrigation by the seep method.

The percentage of soil moisture needed to be maintained and the water table needed to maintain it unfortunately have not been entirely worked out satisfactorily at this time. Obviously it changes due to soil type and area. Research is going on at this time to establish this criteria in some major vegetable production areas.

**Quantity Needed through drip**

The quantity of water that should be injected through drip varies. Ongoing research indicates it should be at least 1 pan per covered bed area. Several times during this spring the pan evaporation was close to 0.3 inches per day. This is quite high; 2.1 inches of rain or irrigation equivalent would be needed per week to overcome this deficit. If drip irrigation was used on a 4 foot center bed with 2 feet of bed being covered, only 1.05 acre inches would need to be injected. For additional information consult Circular 607, "Determination of Water Requirements for Florida Vegetable Crops".

**Fertigation**

Fertilizing through drip irrigation has been recommended for a number of years. All of the P and minor elements should be incorporated into the bed before mulch is laid. Phosphorus is not recommended to be injected through drip irrigation tubes due to clogging problems that have arisen due to water quality and several P source interactions. Between 10 to 40% of the N & K also should be incorporated into the bed initially.

Where seep irrigation must be used for field preparation and plant establishment, the lower rates of N & K should be used to reduce the salt accumulation at the surface.

The remainder of N & K should be injected through the drip as the crop grows and produces. The percentage of injected nutrients should be those found in Circular 606, "Injection of Fertilizers into Drip Irrigation Systems for Vegetables".
Applications of fertilizers should be made once or twice per week.

(Stall - Veg. 6-85)

B. Mineral Nutrient Deficiency Symptoms of Vegetable Crops.

Often plant appearances can tell us much about its health. Plant diseases caused by mineral nutrient deficiencies are largely easy to identify by trained observers because the symptoms are usually quite characteristic.

There are times, however, when the symptoms may be masked or may actually be the result of several simultaneous problems. Also, the nutrient deficiency symptom observed may actually be caused by yet another problem. An example of this might be phosphorus deficiency caused by cool soils. In this case, it was not the soil fertilizer level that was the problem but rather the inability of the plant to obtain the nutrient from the cool soil.

The table below is meant to be a guide in diagnosing probable mineral nutrient deficiency symptoms. In order to develop a control strategy, the underlying cause must be determined. This will involve information on fertilizer practices, environmental conditions, soil pH, soil moisture, levels of other interacting nutrients, and rainfall. Furthermore, consideration must be given to the crop and even to the cultivar since cultivars of various crop species are known to differ in mineral nutrient requirements.

In cases where quick visual identification is difficult, soil and plant tissue analyses must be made. These can be done by the University of Florida Soil Testing Laboratory in Gainesville. When sampling, be sure to include a soil sample from near the affected plants. Also, collect plant tissues and soil samples from normal appearing plants if possible. These tissue samples should be of the same physiological age as the diseased plants.

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<td>Boron</td>
<td>Growing tips die and leaves are distorted. Specific diseases caused by boron deficiency include brown curd and hollow stem of cauliflower, cracked stem of celery, blackheart of beet, and internal browning of turnip.</td>
<td>On soils with pH above 6.8 or on sandy, leached soils, or on crops with very high demand such as cole crops.</td>
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<td>Calcium</td>
<td>Growing point growth restricted on shoots and roots. Specific deficiencies include blossom-end rot of tomato, pepper and watermelon, brownheart of escarole, celery blackheart and cauliflower or cabbage tipburn.</td>
<td>On strongly acid soils or soils where excessive potassium has been applied or during severe droughts.</td>
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<td>Yellowing of leaves, stunting of plants. Onion bulbs are soft with thin, pale scales.</td>
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<td>Iron</td>
<td>Distinct yellow or white areas between veins on youngest leaves.</td>
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<td>Initially older leaves show yellowing between veins, followed by yellowing of young leaves. Older leaves soon fall.</td>
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<td>Yellow mottled areas between veins on youngest leaves, not as intense as iron deficiency.</td>
<td>On soils with high pH (above 6.4).</td>
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<td>Molybdenum</td>
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<td>On very acid soils.</td>
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<td>Zinc</td>
<td>Small reddish spots on cotyledon leaves of beans, light areas (white bud) of corn leaves.</td>
<td>On wet, cold soils in early spring or where excessive phosphorus is used.</td>
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<td>Sulfur</td>
<td>General yellowing of younger leaves and reduced growth.</td>
<td>On very sandy soils, low in organic matter especially following continued use of sulfur-free fertilizers especially in areas that receive little atmospheric sulfur.</td>
</tr>
</tbody>
</table>
Nutrient | Deficiency symptoms | Occurrence |
----------|---------------------|------------|
Chlorine  | Deficiencies very rare. | Usually only under laboratory conditions. |

Literature


(Hochmuth - Veg. 6-85)

C. 1985 Florida Tomato Institute

The 1985 Florida Tomato Institute will be held at the Mariott's Marco Beach Hotel, Marco Island, Florida, Thursday September 5.

The Florida Tomato Committee and the Florida Tomato Exchange will meet Friday and Saturday September 6 & 7.

The topics for the program are listed below.

FLORIDA TOMATO INSTITUTE
Morning Session Moderator: P. R. Gilreath

AM
9:00 Registration and Coffee

9:30 Welcome - D. J. Cantcliffe, Chairman, Vegetable Crops Department, Gainesville

9:45 Fertilizer Management: Back to Basics - G. J. Hochmuth, Vegetable Crops Department, Gainesville

10:00 Soil-Borne Diseases of Tomatoes and Their Control- J. P. Jones and A. J. Overman, Gulf Coast Research & Education Center, Bradenton

10:15 Design and Maintenance of Drip Irrigation Systems for Tomato Production - A. J. Smajstrla, Agricultural Engineering Department, Gainesville

10:45 Water Management with Drip Irrigation Systems - C. D. Stanley, Gulf Coast Research & Education Center, Bradenton

11:00 Fertilizer Management with Drip Irrigation Systems - S. M. Olson, North Florida Research & Education Center, Quincy

11:15 Statewide Tomato Variety Trial Update - P. J. Stoffella, Agricultural Research & Education Center, Ft. Pierce
11:30 Recent Findings in the IFAS Tomato Breeding Program - J. W. Scott, Gulf Coast Research & Education Center, Bradenton

11:45 Questions and Discussion

LUNCH ON YOUR OWN

Afternoon Session Moderator: R. L. Mitchell

PM
1:30 Weed Management in Tomatoes - J. P. Gilreath, Gulf Coast Research & Education Center, Bradenton

1:45 Avoiding Pest Control Entropy: A Review of Sound Integrated Pest Management Principles for Florida Tomatoes
K. L. Pohronezny, Tropical Research & Education Center, Homestead

2:00 The Enigma of Tank Mixes - T. A. Kucharek, Plant Pathology Department, Gainesville

2:15 Frost Protection for Florida Tomatoes with Overhead Irrigation or Row Covers - R. Tyson, Dade County Cooperative Extension Service

2:30 Management of Second Crops following Tomatoes - A. A. Csizinszky, Gulf Coast Research & Education Center, Bradenton

2:45 Tomato Stem Porosity: Minimizing the Potential for Postharvest Decay
J. A. Bartz, Plant Pathology Department, Gainesville

3:00 Update on Florida: West Mexico Competition in the Fresh Market Tomato Industry - J. J. Vansickle and E. Belibasis, Food & Research Economics Department, Gainesville

3:15 Tomato Production Practices in West Mexico - D. J. Cantliffe, Vegetable Crops Department, Gainesville

3:45 Questions and Discussion

(Maynard - Veg. 6-85)

III. VEGETABLE GARDENING

A. Soil mix formula for container gardens

The following charts are presented to assist you in advising gardeners on the right amounts of materials and fertilizer ingredients needed to make up a synthetic soil mix for growing vegetables in containers. I based this on the 5:3:3:1 ratio formula presented by Bradenton AREC for Florida Basket tomatoes.
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Chart 1. Amount of ingredients needed to make a Soil Mix - based on a 5:3:3:1 formula (Bradenton AREC tomato formula)

<table>
<thead>
<tr>
<th>Amt. Mix desired</th>
<th>Vol. Used (FL Peat (5))</th>
<th>Vol. Used (Sand (3))</th>
<th>Vol. Used (Vermic. (3))</th>
<th>Vol. Used (Perlite (1))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cu Yd. Bu Gl</td>
<td>Bu Gl Qt</td>
<td>Bu Gl Qt</td>
<td>Bu Gl Qt</td>
<td>Bu Gl Qt</td>
</tr>
<tr>
<td>1</td>
<td>25 200</td>
<td>10 80 320</td>
<td>6 50 200</td>
<td>6 50 200</td>
</tr>
<tr>
<td>1/2</td>
<td>12.5 100</td>
<td>5 40 160</td>
<td>3 25 100</td>
<td>3 25 100</td>
</tr>
<tr>
<td>1/4</td>
<td>6.25 50</td>
<td>2.5 20 80</td>
<td>1.5 12.5 50</td>
<td>1.5 12.5 50</td>
</tr>
<tr>
<td>3.12</td>
<td>25</td>
<td>1.25 10 40</td>
<td>6.25 25</td>
<td>6.25 25</td>
</tr>
<tr>
<td>1.5</td>
<td>12.5</td>
<td>.6 5 20</td>
<td>3.12 12.5</td>
<td>3.1 12.5</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>3.3 13.3</td>
<td>2 8</td>
<td>2 8</td>
</tr>
<tr>
<td>1/2</td>
<td>4</td>
<td>1.6 6.6</td>
<td>1 4</td>
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<td>2</td>
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Chart 2. Amount of fertilizer to make a Soil Mix - based on the Bradenton AREC Tomato 5:3:3:1 formula.

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<thead>
<tr>
<th>Amount of mix</th>
<th>Fertilizer</th>
<th>Lime</th>
<th>P</th>
<th>fast lime</th>
<th>micros</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cu yd. Bu Gal.</td>
<td>OSM (8-16-12)</td>
<td>Dolomite</td>
<td>5 lb.</td>
<td>5 lb.</td>
<td>5 lb.</td>
</tr>
<tr>
<td>1</td>
<td>25 200</td>
<td>12 lb.</td>
<td>10 lb.</td>
<td>5 lb.</td>
<td>5 lb.</td>
</tr>
<tr>
<td>1/2</td>
<td>12.5 100</td>
<td>6 lb.</td>
<td>5 lb.</td>
<td>2.5 lb.</td>
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<tr>
<td>1/4</td>
<td>6.25 50</td>
<td>3 lb.</td>
<td>2.5 lb.</td>
<td>20 oz.</td>
<td>20 oz.</td>
</tr>
<tr>
<td>3.1</td>
<td>25</td>
<td>1.5 lb.</td>
<td>20 oz.</td>
<td>10 oz.</td>
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<tr>
<td>1.5</td>
<td>12.5</td>
<td>12 oz.</td>
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<td>5 oz.</td>
<td>5 oz.</td>
</tr>
<tr>
<td>1.0</td>
<td>8.0</td>
<td>8.5 oz.</td>
<td>6.5 oz.</td>
<td></td>
<td></td>
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Applications of fertilizers should be made once or twice per week.

(Stall - Veg. 6-85)

B. Mineral Nutrient Deficiency Symptoms of Vegetable Crops.

Often plant appearances can tell us much about its health. Plant diseases caused by mineral nutrient deficiencies are largely easy to identify by trained observers because the symptoms are usually quite characteristic.

There are times, however, when the symptoms may be masked or may actually be the result of several simultaneous problems. Also, the nutrient deficiency symptom observed may actually be caused by yet another problem. An example of this might be phosphorus deficiency caused by cool soils. In this case, it was not the soil fertilizer level that was the problem but rather the inability of the plant to obtain the nutrient from the cool soil.

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### Some Commercial Mixes - Synthetic Soils (examples)

<table>
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<tr>
<th>Medium</th>
<th>Synthetic Soils</th>
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</thead>
<tbody>
<tr>
<td>Pro-Mix BX</td>
<td>Peat moss, perlite, vermic, dolomite, NPK, P, Ca, FTE, Wetting Agent.</td>
</tr>
<tr>
<td>Pro-Mix A</td>
<td>Same, except no perlite.</td>
</tr>
<tr>
<td>Pro-Mix C</td>
<td>Same, except no perlite and NPK (has P).</td>
</tr>
<tr>
<td>Fertile Bag</td>
<td>Same, ready for bag culture (2 cu ft.).</td>
</tr>
<tr>
<td>Germinating Mix</td>
<td>Fine grind, no perlite, same otherwise.</td>
</tr>
<tr>
<td>Jiffy-Mix</td>
<td>Peat, vermic, and NPK.</td>
</tr>
<tr>
<td>Jiffy-Mix Plus</td>
<td>Same, except has Mag-amp (7-40-6).</td>
</tr>
<tr>
<td>Metro-Mix 200</td>
<td>Peat moss, perlite, vermic, granite sand, NPK, wetting agent, pH 5.6 - 6.5.</td>
</tr>
<tr>
<td>Metro-Mix 300</td>
<td>Same, plus bark.</td>
</tr>
<tr>
<td>Redi-Earth</td>
<td>Peat moss, vermic, wetting agent, macros and micros.</td>
</tr>
<tr>
<td>Farard Growing Peat Mix</td>
<td>Peat moss, nitrrients, vermic, perlite, and wetting agent, several formulations.</td>
</tr>
<tr>
<td>Peat-Lite Mix</td>
<td>Same, no perlite, although some formulations have it.</td>
</tr>
<tr>
<td>Super Soil</td>
<td>Called &quot;First Step&quot;, developed by U Cal.</td>
</tr>
<tr>
<td>Cornell Mix</td>
<td>No trade names (mix your own), although Redi-earth is based on it.</td>
</tr>
</tbody>
</table>

### Wetting Agents

- Hydro - Wet
- Aqua - Gro
- Terra - Sorb
- Surf - Side
- Triton B 1956

(Stephens - Veg. 6-85)

### B. Master Gardener Activities

Based on the Field Day concept in other state MG programs, Florida initiated 2 Field Days this spring for active MGs. The first was held on April 20 at the Fort Lauderdale Agricultural Research and
This may be done by water wagons, overhead or seep irrigation.

Soil-Water Relations

When drip irrigation is used, a percentage of soil moisture must be maintained either culturally or through other irrigation sources.

Where threat of flooding is not a severe problem, the bed height should be lowered. High beds will dry out much faster than lower beds. Lateral wetting patterns are much wider when a degree of soil moisture is maintained across the entire bed area.

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Education Center's Open House, followed by tours of the Palm Beach County Extension Mounts Center botanical gardens. At the Ft. Lauderdale REC, MGs were greeted with slide shows on the Center's major areas of research, followed by walking tours on production areas. Specific research presented included: lethal yellowing resistance in susceptible palms, effects of growth hormones on plant growth, use of treated sewage sludge as fertilizer/soil amendment, new foliage varieties (including the now popular Heliconias), turf varieties and management, and biological control of water hyacinth with a beetle. A final interesting project was the mass of fish-rearing pools where the white amur or grass carp is being studied as an effective control of hydrilla.

The Mounts Center tour was hosted by Palm Beach Coordinator, Amy Kellum, and MG Helen Patton. The beautiful gardens of tropical fruits and plants were enjoyed by MGs from 5 counties who participated in the Field Day.

Our next Field Day on April 30 involved the descent of 220 MGs and coordinators on the Apopka area. The day started off with a tour of Knox's Nursery which specializes in bedding plants. The varied and enthusiastic tour included propagation and production tips shared by the staff. The next stop was Hermann Engelmann's Nursery - renowned grower of fine foliage plants. The colorful array of hanging baskets, potted plants and propagation areas (including the tissue culture section) made many MGs want to buy one of the many greenhouses on the tour and start their own business. The intensity of quality control confirmed, however, the necessity of a strong backup (in capital and labor) for success.

A visit to the Apopka Agricultural Research Center included self-guided tours of leather leaf fern shade houses, new foliage varieties and special chambers to study different environmental conditions' effects on plants.

The final stop at Florida Cactus provided an outlet to purchase some of the beautiful cacti on display. Of special interest was the map of the U.S. with each state represented by different cacti.

On August 21, the Fifth Annual Master Gardener Advanced Training will commence in Gainesville with 1 1/2 days of classes ranging from "Low Maintenance Landscapes" to "Freeze Protection of Dooryard Plants". An Awards Banquet will be held on August 21 at the University Holiday Inn to recognize those volunteers with exceptional service records. Tours to eight different University and area horticultural operations will be given on August 23. Pre-registration forms are included in this month's Voluntiller. Active MGs and coordinators are urged to register as early as possible.

(Delate - Veg. 6-85)
I. NOTES OF INTEREST
   A. Vegetable Crops Calendar

   June 24 - 28, 1985. 4-H Horticulture Institute, Camp Cloverleaf, Sebring.

   July 29 - August 1, 1985. 4-H Congress, Gainesville
       (Horticulture Contests on July 30; Horticulture Workshop on August 1).


       Marriott's Marco Beach Resort, Marco Island. Tomato Institute will be held on September 5.

II. COMMERCIAL VEGETABLES
   A. Drip Irrigation Update

   The major objective of irrigation is to supply plants with sufficient water to prevent periods of stress that may result in reduced yields or quality. The major irrigation types currently used in vegetable production are seep irrigation and overhead irrigation. Drip irrigation is gaining in use for several commodities state wide and is used extensively in vegetables in two locations. Specific information gaps have been pointed out for the use of drip irrigation in several parts of the state. In several instances research is available to answer the perceived gaps, but unfortunately, in other instances, more research is needed.

   To establish statewide drip irrigation cultural recommendations and identify research needs, a group of researchers from Gainesville and several agricultural research centers met with state and county extension faculty at the Gulf Coast Research and Education Center in Bradenton in May. The following points were discussed and should be added to future educational programs for growers interested in drip production.

   Field Preparation
       Good soil moisture must be established in the field for fumigation. This may have to be done with overhead or seep irrigation. Rainfall is not always timely or adequate.

       Drip irrigation should be used before seeding or transplanting to maintain soil moisture levels. Rewetting dry soil by any irrigation method is many times very difficult.

   Plant Establishment
       In some soils during very dry or windy conditions, water in addition to drip irrigation may be needed for plant establishment.
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