The VEGETARIAN Newsletter

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TO: COUNTY EXTENSION DIRECTORS AND AGENTS (VEGETABLES AND HORTICULTURE) AND OTHERS INTERESTED IN VEGETABLE CROPS IN FLORIDA

FROM: Stephen R. Kostewicz, Extension Vegetable Specialist

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I. NOTES OF INTEREST

A. Call for Papers -- 1975 FSHS Meeting

Any member wishing to present a paper in the VEGETABLE SECTION at the November 4-7, 1975, meeting of the Florida State Horticultural Society should send his title and two copies of an abstract of 100 to 150 words to me at the following address not later than July 1, 1975: University of Florida, IFAS, Vegetable Crops Department, 3026 McCarty Hall, Gainesville, Florida, 32611. The senior author of the paper must be a member of the Society. Other authors are encouraged to be members.

The Society prefers papers that describe completed applied research pertaining to horticultural plants and products, or new developments and practices that have been put in use by growers, processors, allied industries, or other horticultural interests in Florida. Papers written by growers and processors are definitely desired.

The Society does not prefer purely basic research papers, papers of a promotional nature, progress reports, or papers in which the growing, harvesting, handling, marketing and processing of Florida horticultural plants is only remotely concerned.

I will notify senior authors concerning the acceptance, handling and scheduling of their papers. If there are any questions, my phone number is 904-392-1794. (Montelaro)

II. COMMERCIAL VEGETABLE PRODUCTION

A. Reflections and Observations on Existing Greenhouse Tomato Production in Florida

County extension personnel in north and west Florida are acutely aware of the recent surge of interest or popularity of greenhouses for tomato production. Hardly a day passes without this office learning of a new "house", or answering questions from interested parties seeking information on this type of production.

Our position on the feasibility of this type of production remains unchanged in that we do not unqualifyingly encourage people to undertake this type of culture. We continue to point out the many difficulties and urge very close scrutiny relative to marketing outlet and cost of production for tomatoes grown in this manner. In other words, we are not overly optimistic yet, we try to be as objective as possible. It is unfortunate that most of the people we find operating these houses have had very little prior exposure to agriculture, let alone the intensive type of production required for vegetables, and the even more intensive culture of greenhouse tomatoes. Most are lured into purchasing these houses by the claims of high returns reported by most outfits selling these units. These claims are theoretically attainable, but most of the figures have been interpolated from production areas outside of Florida and the southeast. As yet, we have been unable to find a house in Florida attaining the high yields claimed.

This office has and will continue to offer assistance with production problems for agents with greenhouse operations in their counties. However, the problems most frequently encountered by this author have been with fertilizer practices and disease control.
In the area of fertilizer elements, nitrogen, potassium, magnesium and calcium have been the most frequent problem areas. Usually on questioning the producer as to his fertilizer practices, one finds that he knows very little about the details. The response usually is, "I use 1 teaspoon of Brand X fertilizer per gallon every time I water". The analysis is not known by the producer, but this is what the instructions with the house said to use.

Specifically, this author has observed the following:

1. Excessive nitrogen fertilization resulting in;
   a. poor fruit set,
   b. a dense canopy offering poor air circulation resulting in disease problems.

2. Potassium deficiency accompanied by;
   a. poor growth, typical foliar deficiency symptoms,
   b. plant responses to KCl applications.

3. Calcium or water stress resulting in;
   a. blossom-end rot,
   b. recovery in young fruit following application of calcium.

4. Magnesium deficiency accompanied by;
   a. severely yellowed leaves showing the dark veins typical of the symptoms.

5. Soluble salt injury
   a. resulting from too much fertilizer too frequently,
   b. leading to typical burning of leaves beginning at base of plant and progressing upward.

The usual response of the producer without any knowledgeable help is to start switching brands of fertilizer until his crop "recovers" or is lost. Diseases have been a serious problem in most of these houses, and one might say, "If the fertilizer program doesn't get them, the diseases usually will". Leaf mold and botrytis have been the most damaging. On a good spray program with proper ventilation to keep humidity below 85-90%, these diseases can be held in check. The problems with these diseases usually can be traced to one of the following in most houses this author has visited.

1. Spray program lacking or erratic.
2. Poor spray coverage.
3. Excessive humidity usually caused by:
   a. poor air movement in the house,
   b. excessive foliage (high N or poor pruning) which results in poor air circulation into the plant canopy.

As most know, these problems are severe and reduce yield potential drastically. Other problems, cultural and managerial in nature, usually can be found in most houses and indeed few to our knowledge are making money when one considers all the facets of this intensive culture. We remain willing to cooperate with agents on houses having problems in their county in the best way we can. This author plans to contact counties in the future in an attempt to pinpoint and have a clearer picture as to the status of these operations in the state. Your cooperation in this regard will be much appreciated.

(Kostewicz)
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B. Water Quality--Problems and Solutions in Vegetable Production

This is the second in a series of articles dealing with problems encountered by producers of vegetables in Florida using poor quality irrigation water. This article discusses changes in production practices which might be used to cope with these problems. The reader is referred to our introductory article of last month for a discussion of water quality--definition, measurements, classification, etc.

Irrigation water to be used for vegetable production should be analyzed for total soluble salt (TSS). A water-quality analysis permits growers to make plans for modification of production practices, if necessary, to avoid or to reduce the injurious effect of high soluble salts. Following are some of the production practices which can be modified to reduce the effects of poor quality irrigation water.

(1) Select "salt-tolerant" crops

Crops vary in their susceptibility to salt injury. Strawberries, beans, celery and radish are highly susceptible (very low tolerance) to injury from high TSS. On the other hand, tomato, broccoli, cabbage and cauliflower are quite tolerant as shown in Table I. This does not mean that those crops in the "tolerant" groups cannot be injured by high salts. It only means that they are not injured as readily as the others by high concentrations of salts. For example, cucumber and cabbage growing side by side in a field in central Florida last spring and irrigated from the same well responded differently to high TSS. Cucumber was severely injured by high salts, but the cabbage crop appeared to be normal.

Table I. Relative Tolerance of Vegetable Crops to Salt Injury

<table>
<thead>
<tr>
<th>Relative Tolerance</th>
<th>Crops</th>
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<tbody>
<tr>
<td>Very low</td>
<td>Strawberries</td>
</tr>
<tr>
<td></td>
<td>Bean (Bush &amp; Pole)</td>
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<tr>
<td></td>
<td>Celery</td>
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<td></td>
<td>Radish</td>
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<td></td>
<td>Cantaloupe</td>
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<td></td>
<td>Cucumber</td>
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<td></td>
<td>Squash</td>
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<td></td>
<td>Watermelons</td>
</tr>
<tr>
<td></td>
<td>Onions</td>
</tr>
<tr>
<td></td>
<td>Carrots</td>
</tr>
<tr>
<td>Low</td>
<td>Peas, English</td>
</tr>
<tr>
<td></td>
<td>Sweet Corn</td>
</tr>
<tr>
<td></td>
<td>Lettuce</td>
</tr>
<tr>
<td></td>
<td>Sweet Potatoes</td>
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<tr>
<td></td>
<td>Irish Potatoes</td>
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<tr>
<td></td>
<td>Peppers</td>
</tr>
<tr>
<td>Medium</td>
<td>Cauliflower</td>
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<tr>
<td></td>
<td>Cabbage</td>
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<tr>
<td></td>
<td>Broccoli</td>
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<tr>
<td></td>
<td>Tomato</td>
</tr>
<tr>
<td>High</td>
<td>Spinach</td>
</tr>
<tr>
<td></td>
<td>Kale</td>
</tr>
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<td></td>
<td>Beets</td>
</tr>
</tbody>
</table>
(2) Modify bed shape

Soluble salts move in soil water. During periods of evaporation, they accumulate at the center or the highest point in the bed. Flat-top beds are recommended as a means of reducing salt injury to single-row crops. Two-row crops might best be planted on a crowned bed.

(3) Use containerized transplants to start crops, where possible

Seedlings of all crop species generally are susceptible to salt injury. As seedlings grow, they become less apt to be injured by high salts. Containerized transplants, where applicable, can be used instead of direct seeding to reduce seedling injury from salts.

(4) Modify irrigation methods

Many vegetables are grown under seepage or sub-surface irrigation. As soil moisture evaporates, salts accumulate at or near the soil surface proportionate to the amount of TSS in the water and the length of the evaporation period. High salt concentration near the soil surface can be damaging to seedlings. Moved by a light rain to the root zone of a growing crop, the same salts can injure the more mature crops.

To counteract this problem, it is suggested that growers switch to overhead sprinkler irrigation when using low-quality water. By continually moving the salts down, surface salt accumulation can be reduced significantly. NOTE: Recent developments in drip irrigation looks promising as a method of not only conserving water, but lessening salt problems.

(5) Irrigate heavily to wash salts below root zone

Using overhead sprinkler systems as suggested above, it would be wise to irrigate with sufficient quantity of water to move the salts below the root zone each time. By doing this, soluble salts accumulating in the effective root zone can be maintained at lower levels than otherwise.

(6) Modify fertilizer and fertilization practices

There are a number of practices in fertilization which can be modified to reduce TSS. It should be remembered that fertilizers contribute to TSS soluble salts as does irrigation water. Following are suggestions for managing a vegetable fertilizer program where soluble salts may be a problem.

(a) Use the low-salt index materials in all fertilizers.

(b) Apply the fertilizer more frequently and in smaller amounts.

(c) Broadcast and mix into the soil part or all of the basic or initial application of fertilizer used before, at or following plantings.

It is possible for growers to modify their production practices to produce most crops satisfactorily with their present supplies of irrigation water provided they are not overly high in soluble salts. However, the simplest solution to poor-quality water problems would be to find a better source of water. This subject will be covered in a succeeding article.

(Montelaro and Locascio)
C. Two "Soil Activators" - Extensively Tested With Negative Results

A number of materials, under various trade names, are being sold to vegetable growers as "soil activators." Purportedly, the soil activators offer a myriad of benefits ranging from disease control to biological conditioning of the soil. Are they really worthwhile? No, says a report published recently for at least two soil activators tested extensively. The study is summarized in Southern Cooperative Series Bulletin 189 entitled "Effect of Two Soil Activators and Activities of Soil Microorganisms in the Southern United States."

The study was conducted over a three year period by twenty soil scientists from eight state experiment stations and the USDA. It covered field and laboratory studies with a number of crops under a wide variety of climatic and soil conditions. The results can be relied upon to be accurate. The results obtained with the two soil activators tested (Medina and Supernate) are as follows:

1. Based on laboratory analyses, Medina and Supernate contain plant nutrients that are already common to soils. Amounts of these elements, that would be added to soil, based on manufacturer's recommendations, would be low in relation to crop nutrient requirements.

2. Application of these products at recommended rates did not alter the number or activity of microorganisms that were naturally present in soil. The microorganism population in the products was considered to be too low for the products to be regarded as soil or plant inoculants.

3. The severity of cotton root rot was not reduced in greenhouse tests or in well-designed field trials where plots were of reasonable size for plant or yield evaluation.

4. Yields of grain sorghum, cotton, oats or bermudagrass forage, soybeans, rice, peanuts, or tomatoes were not significantly increased with recommended application of Medina or Supernate. Products were evaluated both with and without conventional fertilizers, on a wide variety of soils, and in irrigated and dryland fields. Where yields of succeeding crops were obtained, there was no indication of a delayed benefit.

It is not the intent of this article to condemn all new "products and services" as some may have potential for use in crop production. However, the results should convince vegetable growers to look into new products and services very carefully before spending money on them.

(Montelaro)

III. VEGETABLE GARDENING

A. Timely Gardening Topics

These questions and answers are suggested for agents' use in developing periodic (weekly) radio or newspaper briefs. They are based on letters of inquiry from Florida gardeners.
(1) Timely Topic for week of June 15-21.

Question

Recently, I have seen advertised garden watering kits called trickle irrigation. What are these and are they of value?

Reply

Trickle or drip irrigation is a relatively new method of irrigation, as far as gardens are concerned. The technique involves supplying plants with constant moisture at a low delivery rate and at very low operating pressures through specially designed tubing. Several systems are available to home gardeners, although most have to be ordered from distant supply companies. All systems need a source of water such as the house spigot, a distribution system to each row, pressure regulator, a filter, and most important, the drip lines. Most common drip lines now available are Chapin Twin-wall, Drip-Eze Biwall and DuPont Viatflo.

The advantages are many, some of which are: water conservation, energy savings, ease of wetting on deep or sloping sands, reduction of weed growth in row middles, ease of water application, fertilization through water under plastic, avoidance of wetting and rinsing leaves, and minimum disturbance of soil structure.

(2) Timely Topic for week of June 22-28.

Question

We are interested in starting a community garden project. What are some of the considerations?

Reply

The most important requirement for any successful community garden project is a "leader"--someone with enthusiasm plus a gift for organizing.

Next, you will need land, some sources of which are community-minded companies, local planning authorities, church groups and public spirited private landowners.

The best location is within easy reach of the majority of participants, and with access to a water supply. Secure a location that is not temporary.

Hire someone to plow the entire area, then keep in mind the need for toilet facilities, lockable tool shed and a fence to prevent vandalism and thievery. Divide the land into equal plots, allocating one plot to each gardener or family group. Gardening the entire area like one big "commune" doesn't always work. Each person with his own area to plant and care for is best. Keep plots small so gardens are not neglected.

(3) Timely Topic for week of June 29-July 5.

Question

I often see potato sprouts or buds for sale as seedpieces. Will these sprout and produce a crop?
Reply

Such a sprout is usually a bit of tuber about the size of the thumbnail which contains a single eye (a bud). Yes, seedpieces will sprout and produce a plant, but research has shown that best yields are obtained from larger seedpieces which average at least 2 ounces in size and, of course, which contain at least one eye.

(4) Timely Topic for week of July 6-July 12.

Question

What are some good cover crops for my Florida home garden?

Reply

A good cover crop should be leguminous; that is, have the ability to convert atmospheric nitrogen to organic nitrogen. Actually, one of the best choices for the average home gardener would be Southern peas. Their use as a summer cover crop can provide two-fold benefits—soil improvement and food production; although most varieties produce more vines than pea pods in the summer. Other good choices, depending on local adaptations, are crotalaria, hairy indigo, sesbania and lupine. Sesbania requires a wet low land soil for good growth. Keep in mind that seeds of Crotalaria spectabilis are toxic to livestock.

Besides cover cropping, gardeners have several other good ways to improve garden soil such as incorporating compost and animal manures.

B. Know Your Vegetables - Citron

Citron, Citrullus lanatus var. citroides, is also known as stock melon and preserving melon. It should not be confused with the citron of the citrus fruit family (Citrus medica) whose peel is candied and frequently used in fruit cakes. The citron melon is a plant of the same species as watermelon, but the fruit is inedible in the raw state. These fruits resemble small watermelons, being round to oval, up to 6 inches long, light green with darker green stripes, and smooth-surfaced. The flesh is white and so tough that the fruits can be bounced on the floor with only a small chance of bursting. The seeds are not marbled as often as those of watermelons. Each of the low, "running" plants, like the watermelon, has both male and female flowers, requiring bees for pollination. Due to the close relationship to watermelon, cross-pollination between the two occurs often. Gardeners should not be concerned with the results of such crossing, unless seeds of the melons are saved for planting.

Volunteer citron plants are commonly found scattered around old fields and road-sides throughout Florida. They are not often cultivated, but where desired, they should be grown in a manner similar to watermelons and cantaloupes. The flesh and rind are sometimes used for making preserves and pickles. Other reports indicate occasional use as hogfeed.