Vegetarian 88-06

June 15, 1988

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I. NOTES OF INTEREST

A. Vegetable Crops

Calendar.

June 20-24, 1988. 4-H Horticulture Institute, Camp Cloverleaf. (Contact Jim Stephens).

June 21, 1988. Vegetable Twilight Field Day. Live Oak Agricultural Research and Education Center, Live Oak, Fl. from 5:00 to 8:00 PM. (Contact George Hochmuth).


B. Publications.


II. COMMERCIAL VEGETABLES

A. Leaf silvering of squash.

In the past several years, a condition of squash has appeared in south Florida, commonly known
as leaf silvering. This condition is also found in Israel.

Dr. Harry Paris, Dept. of Vegetable Crops, Agricultural Research Organization, Nerve Ya'ar Experiment Station, Israel, has published an article on leaf silvering (Can. J. Plant Sci. 67:593-598).

Dr. Paris also spent a year on sabbatical in Florida in 1986-87. From this article several phenomenon of this disorder is described. He states that leaf silvering is a physiological disorder. In Israel the disorder is seen in late summer and fall crops.

Silvering resembles silver mottling, a genetic (single dominant gene) leaf character. Silvering is expressed in and parallel to leaf veins, except in severe cases, when it encompasses the entire leaf. Silver mottling is expressed as patches in the axes of leaf veins. In both conditions neither appears early in plant development. Also, if a leaf has the condition, it will remain so.

They are different in that in silver mottling, when the condition appears on one leaf, the following leaves, when they emerge, will have the condition. Silvering of a leaf, however, does not preclude later leaves from being green. Anatomically, both the genetically determined silver-mottled leaves and the physiological leaf silvering are attributable to the lack of close contact between palisade cells and contact between palisade cells and the epidermis, resulting in air spaces. Silver-mottled leaves have been reported to reflect more light than non-mottled (green) leaves.

Dr. Paris reported in his paper that although the incidence of silvering was not affected, the severity of the silvering was significantly affected by soil moisture. The lower the moisture, the greater the severity. He also speculated that silvering may be interpreted as a plant defensive response against desiccation. This theory corresponds with the greater incidence of the problem during their no-rain periods of late summer and fall.

The incidence of silvering during the "drier" months of the year also corresponds to Florida. The initiation of the condition probably occurs in the bud and becomes pronounced as the leaf expands. We in Florida and those in Israel have not yet identified the factors necessary for silvering to be induced.

Although many speculate on a virus, no isolations have been seen after numerous attempts. Air pollution and insect feeding have also been raised as possible answers. Both of these are being studied, but as yet, no correlation as been found.

There is considerable ongoing work to isolate the cause of the problem. If any correlations to environmental or biological factors are made by anyone in the observations of the leaf silvering occurrences, I would appreciate being informed. If we can finally isolate the cause, then a control can be worked on.

(Stall, Veg. 88-06)

B. More pepper nitrogen demonstrations.

This past winter, Ken Shuler, Phyllis Gilreath, and I continued our field demonstrations on pepper fertilizer management and soil-test calibration. Our objectives
are to demonstrate IFAS nitrogen and potassium fertilizer recommendations and to collect data for calibrating our potassium soil test procedure.

This article reports on the effects of the nitrogen treatments on pepper yield at Boynton Beach (DuBois Farms). In this study, the grower applied his basic (starter mix) of fertilizer (800 lb. per acre of 6-8-6) in shoulder bands on August 28. We then applied various combinations of nitrogen and potassium to the center band of our plots. Total nitrogen amounts were 160, 220, 280, and 336 lb. of N per acre. The 336 lb. per acre was the grower rate. Potassium treatments ranged from 48 to 416 lb. of K₂O per acre.

Table 1. Response of pepper to levels of nitrogen in a winter crop at Boynton Beach, Fl. 1988-89.

<table>
<thead>
<tr>
<th>N rate (lb/acre)</th>
<th>Nov. 30</th>
<th>Dec. 15</th>
<th>Dec. 29</th>
<th>Jan. 12</th>
<th>Jan. 29</th>
<th>Feb. 18</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>160</td>
<td>456X</td>
<td>449</td>
<td>332</td>
<td>214</td>
<td>147</td>
<td>85</td>
<td>1,683</td>
</tr>
<tr>
<td>220</td>
<td>480</td>
<td>383</td>
<td>402</td>
<td>233</td>
<td>137</td>
<td>90</td>
<td>1,725</td>
</tr>
<tr>
<td>280</td>
<td>474</td>
<td>394</td>
<td>386</td>
<td>221</td>
<td>123</td>
<td>87</td>
<td>1,686</td>
</tr>
<tr>
<td>336/416Y</td>
<td>424</td>
<td>408</td>
<td>342</td>
<td>205</td>
<td>188</td>
<td>104</td>
<td>1,671</td>
</tr>
<tr>
<td>Commercial</td>
<td>449</td>
<td>439</td>
<td>335</td>
<td>175</td>
<td>102</td>
<td>56</td>
<td>1,556</td>
</tr>
</tbody>
</table>

XAverage of 9 observations (3 reps; 3K₂O rates).
YCommercial fertilizer rate with 'PR 7594'.
ZCommercial fertilizer rate with 'Early CalWonder'.

(Hochmuth, Veg. 88-06)

C. Chlorination of dump tanks.

Dump tank chlorination is a water purification treatment. It does not disinfect the tissue of contaminated vegetables but does prevent the spread of decay-producing organisms in the water of the dump tank. Currently, it is recommended that chlorine be maintained at 100 to 150 ppm, although 50 ppm of chlorine is probably more than adequate if that level is maintained.

The most common disinfectants containing chlorine that are now in general use are...
chlorine gas, sodium hypochlorite (commercial bleach at 10-12%), and calcium hypochlorite (chlorinated lime at about 65%). All these chlorine-containing chemicals form hypochlorous acid when added to water.

Germicidal activity of chlorinated dump tanks depends upon factors such as water temperature, the amount of organic matter present, exposure time to the chlorine, and pH of the water. In the past, minor consideration has been given to these factors because most dump tanks use heated water, additional chlorine is added throughout the day to compensate for increasing organic matter and tanks are also cleaned daily, exposure time to the chlorine is adequate, and under Florida conditions we have considered water pH to be in the "effective" range.

The use of chlorine has an effect upon the pH of the water, depending on the type of chlorine used. Also, water pH is a critical factor in maintaining effective chlorine concentrations. For example:

<table>
<thead>
<tr>
<th>Water pH</th>
<th>Cl effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5</td>
<td>90%</td>
</tr>
<tr>
<td>7.0</td>
<td>75%</td>
</tr>
<tr>
<td>7.5</td>
<td>50%</td>
</tr>
<tr>
<td>8.0</td>
<td>25%</td>
</tr>
</tbody>
</table>

For maximum effectiveness, water pH should be maintained at 6.5 to 7.5.

We have been in contact with a water treatment company operating out of Sarasota and they have installed their system in two packinghouses in Florida. The basis of their system is the automatic control of water pH and the metering of chlorine (sodium hypochlorite) to maintain 150 ppm of free chlorine. Under these controlled conditions the level of chlorine could be lowered for an additional saving. Their system of pH control and metering of chlorine has reduced the daily usage of hypochlorite by one half. This reduction in the use of chlorine and the more favorable water pH should reduce the corrosiveness to equipment, lower the unpleasant odors of chlorine in the vicinity of the dump tank, and have a favorable economic impact upon the packinghouse operation. More details of this system will be made available as results are obtained. Name of the company will be furnished upon request.

(Gull, Veg. 88-06)

III. VEGETABLE GARDENING

A. Disease resistance in Florida garden tomatoes.

We all want to avoid spraying pesticides on our gardens if at all possible. However, with all the disease and insect pests we have in our warm, muggy state, we sometimes have to give the little scavengers a quick chemical kick in the rear end if we are to get any returns for our efforts.

One of the best ways to reduce the need to spray is to plant varieties of vegetables that have pest resistance, or at least tolerance, built into their genes. But when we look at the long list of varieties recommended for our area, we really can't tell which ones are resistant to what. Okay, maybe we should list in our guides the pests which these varieties are supposed to ward off. Planting guides are brief and concise to avoid the appearance of textbooks and bulletins, so space is limited.
To provide more information in this area I shall utilize our Vegetarian newsletter. Let's start with the big red one - the tomato. In subsequent issues we'll continue with the other vegetable varieties. Circular 104P, the Vegetable Gardening Guide is our main reference on current varietal recommendations. Looking at the current list of tomato varieties. (by the way, also known as "cultivars"), we find the following, which are hereby described according to disease resistance. Since resistance to other pests such as insects and nematodes is seldom found in the tomato, we'll list only those diseases for which the varieties are legitimately resistant.

Tomato varieties in current vegetable gardening guide (Cir. 104P)

<table>
<thead>
<tr>
<th>Name</th>
<th>Fruit type</th>
<th>Plant type</th>
<th>Disease resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floradel</td>
<td>Large red</td>
<td>Indet.</td>
<td>Fus. wilt (1); gray leafspot; graywall</td>
</tr>
<tr>
<td>Tropic</td>
<td>Large red</td>
<td>Indet.</td>
<td>Fus. wilt (1); vert. wilt; gray leafspot; graywall</td>
</tr>
<tr>
<td>Manalucie</td>
<td>Large red</td>
<td>Indet.</td>
<td>Fus. wilt (1); Early blight; gray leafspot; gray wall; leafmold</td>
</tr>
<tr>
<td>Better Boy</td>
<td>Large red</td>
<td>Indet.</td>
<td>Fus. wilt (1); verticillium wilt</td>
</tr>
<tr>
<td>Cherry Grande</td>
<td>Small red</td>
<td>Det.</td>
<td>Fus. wilt (1); vert, gray leafspot; Alternaria stem</td>
</tr>
<tr>
<td>Walter</td>
<td>Large red</td>
<td>Det.</td>
<td>Fus. (1,2); gray leafspot; graywall</td>
</tr>
<tr>
<td>Suncoast</td>
<td>Large dp. red</td>
<td>Det.</td>
<td>Fus. (1,2); vert.; gray leafspot</td>
</tr>
<tr>
<td>Floramerica</td>
<td>Large red</td>
<td>Det.</td>
<td>Fus. (1,2); gray leafspot; gray mold; crown rot.</td>
</tr>
<tr>
<td>Flora-Dade</td>
<td>Large red</td>
<td>Det.</td>
<td>Fus. (1,2); vert.; gray leafspot</td>
</tr>
<tr>
<td>Duke</td>
<td>Large red</td>
<td>Det.</td>
<td>Fus. (1,2); vert.; gray leafspot; stem alt.</td>
</tr>
<tr>
<td>Florida Basket</td>
<td>small red</td>
<td>Det.</td>
<td>Gray leafspot</td>
</tr>
<tr>
<td>Florida Lanai</td>
<td>small red</td>
<td>Det.</td>
<td>Gray leafspot</td>
</tr>
</tbody>
</table>
A quick glance clearly shows that many serious diseases of tomato are missing from the above table. Some of these include bacterial leafspot, bacterial wilt, late blight, and early blight. Therefore, the planting of resistant varieties will help in reducing pesticide applications, but does not eliminate them altogether.

(Stephens, Veg. 88-06)